Is Now Part of

ON Semiconductor®

To learn more about ON Semiconductor, please visit our website at
www.onsemi.com

Please note: As part of the Fairchild Semiconductor integration, some of the Fairchild orderable part numbers will need to change in order to meet ON Semiconductor's system requirements. Since the ON Semiconductor product management systems do not have the ability to manage part nomenclature that utilizes an underscore (_), the underscore (_) in the Fairchild part numbers will be changed to a dash (-). This document may contain device numbers with an underscore (_). Please check the ON Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.onsemi.com. Please email any questions regarding the system integration to Fairchild_questions@onsemi.com.

www.onsemi.com

ON Semiconductor®

FDMC8010

N-Channel PowerTrench® MOSFET

30 V, 75 A, 1.3 mΩ

Features

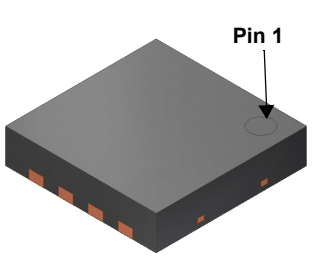
- Max $r_{DS(on)}$ = 1.3 mΩ at V_{GS} = 10 V, I_D = 30 A
- Max $r_{DS(on)}$ = 1.8 mΩ at V_{GS} = 4.5 V, I_D = 25 A
- High performance technology for extremely low $r_{DS(on)}$
- Termination is Lead-free and RoHS Compliant

General Description

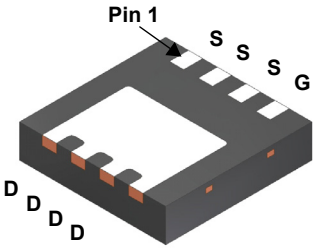
This N-Channel MOSFET is produced using ON Semiconductor's advanced PowerTrench® process that has been especially tailored to minimize the on-state resistance. This device is well suited for applications where ultra low $r_{DS(on)}$ is required in small spaces such as High performance VRM, POL and Oring functions.

Applications

- DC - DC Buck Converters
- Point of Load
- High Efficiency Load Switch and Low Side Switching
- Oring FET

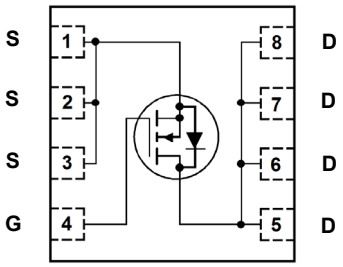


Top



Bottom

Power 33



MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter			Ratings	Units
V_{DS}	Drain to Source Voltage			30	V
V_{GS}	Gate to Source Volage		(Note 4)	±20	V
I_D	Drain Current -Continuous (Package limited)	T_C = 25 °C		75	A
	-Continuous (Silicon limited)	T_C = 25 °C		166	
	-Continuous	T_A = 25 °C	(Note 1a)	30	
	-Pulsed			120	
E_{AS}	Single Pulse Avalance Energy		(Note 3)	153	mJ
P_D	Power Dissipation	T_C = 25 °C		54	W
	Power Dissipation	T_A = 25 °C	(Note 1a)	2.4	
T_J, T_{STG}	Operating and Storage Junction Temperature Range			-55 to +150	°C

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case	2.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient (Note 1a)	53	

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDMC8010	FDMC8010	Power 33	13 ”	12 mm	3000 units

Semiconductor Components Industries, LLC, 2017
Apr, 2017, Rev. 1.2

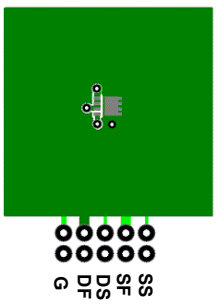
Publication Order Number:
FDMC8010

Electrical Characteristics T_J = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 1 mA, V_{GS} = 0 V	30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 1 mA, referenced to 25 °C		15		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 24 V, V_{GS} = 0 V			1	μA
I_{GSS}	Gate to Source Leakage Current	V_{GS} = 20 V, V_{DS} = 0 V			100	nA
On Characteristics						
$V_{GS(th)}$	Gate to Source Threshold Voltage	V_{GS} = V_{DS}, I_D = 1 mA	1.2	1.5	2.5	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 1 mA, referenced to 25 °C		-5		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 30 A		0.9	1.3	mΩ
		V_{GS} = 4.5 V, I_D = 25 A		1.3	1.8	
		V_{GS} = 10 V, I_D = 30A, T_J = 125 °C		1.3	2	
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 30 A		188		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 15 V, V_{GS} = 0 V, f = 1 MHz		4405	5860	pF
C_{oss}	Output Capacitance			1570	2090	pF
C_{rss}	Reverse Transfer Capacitance			167	250	pF
R_g	Gate Resistance		0.1	0.5	1.25	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 15 V, I_D = 30 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		15	27	ns
t_r	Rise Time			7.5	15	ns
$t_{d(off)}$	Turn-Off Delay Time			40	64	ns
t_f	Fall Time			5.3	11	ns
Q_g	Total Gate Charge	V_{GS} = 0 V to 10 V; V_{DD} = 15 V, I_D = 30 A		67	94	nC
Q_g	Total Gate Charge	V_{GS} = 0 V to 4.5 V; V_{DD} = 15 V, I_D = 30 A		32	45	nC
Q_{gs}	Gate to Source Charge	V_{DD} = 15 V, I_D = 30 A		10		nC
Q_{gd}	Gate to Drain “Miller” Charge	V_{DD} = 15 V, I_D = 30 A		9.5		nC
Drain-Source Diode Characteristics						
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 2 A (Note 2)		0.6	1.2	V
		V_{GS} = 0 V, I_S = 30 A (Note 2)		0.7	1.2	
t_{rr}	Reverse Recovery Time	I_F = 30 A, di/dt = 100 A/μs		49	78	ns
Q_{rr}	Reverse Recovery Charge			29	46	nC

Notes:

1. $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a 1.5 x 1.5 in. board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a. 53 °C/W when mounted on a 1 in^2 pad of 2 oz copper.

b. 125 °C/W when mounted on a minimum pad of 2 oz copper.

2. Pulse Test: Pulse Width < 300 μs, Duty cycle < 2.0 %.

3. E_{AS} of 153 mJ is based on starting T_J = 25 °C, L = 0.3 mH, I_{AS} = 32 A, V_{DD} = 27 V, V_{GS} = 10 V. 100% test at L = 0.1 mH, I_{AS} = 47 A.

4. As an N-ch device, the negative Vgs rating is for low duty cycle pulse occurrence only. No continuous rating is implied.

Typical Characteristics T_J = 25°C unless otherwise noted

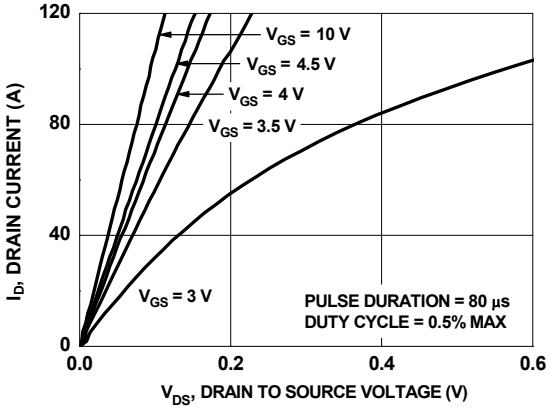


Figure 1. On Region Characteristics

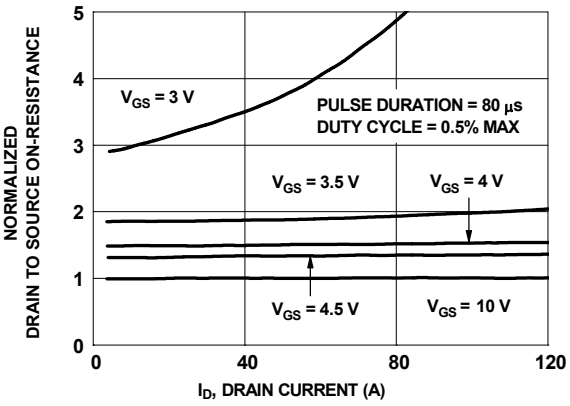


Figure 2. Normalized On-Resistance vs Drain Current and Gate Voltage

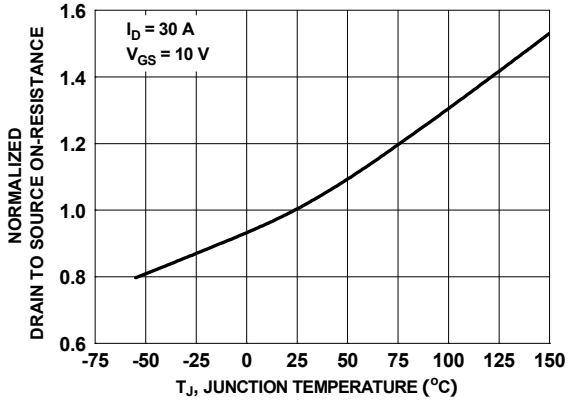


Figure 3. Normalized On Resistance vs Junction Temperature

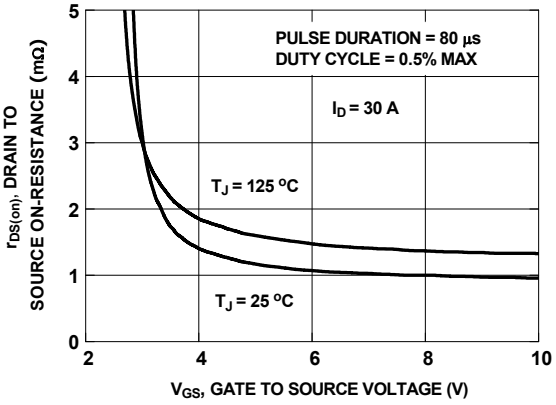


Figure 4. On-Resistance vs Gate to Source Voltage

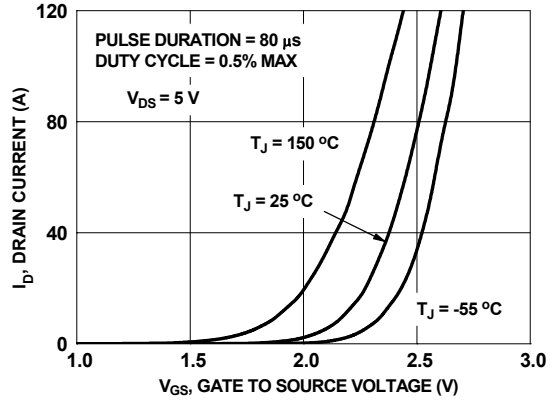


Figure 5. Transfer Characteristics

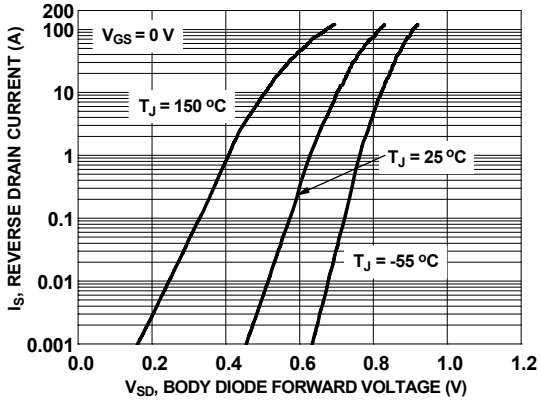


Figure 6. Source to Drain Diode Forward Voltage vs Source Current

Typical Characteristics T_J = 25°C unless otherwise noted

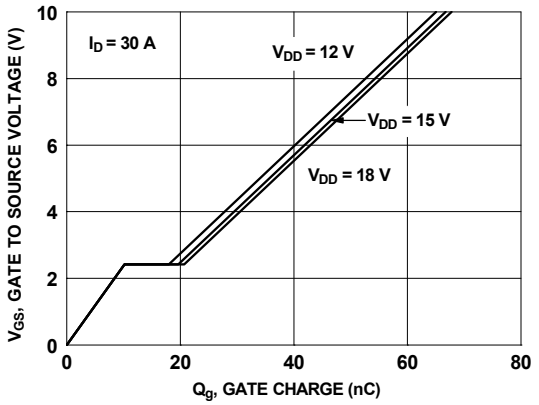


Figure 7. Gate Charge Characteristics

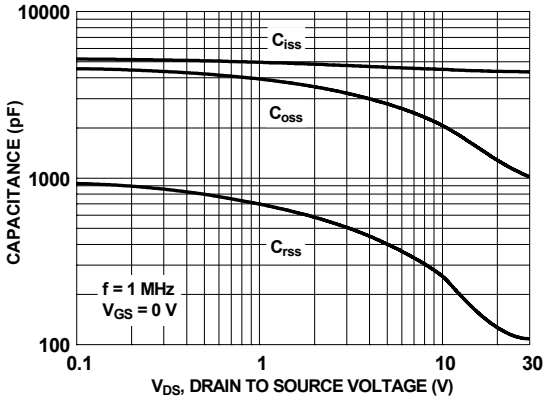


Figure 8. Capacitance vs Drain to Source Voltage

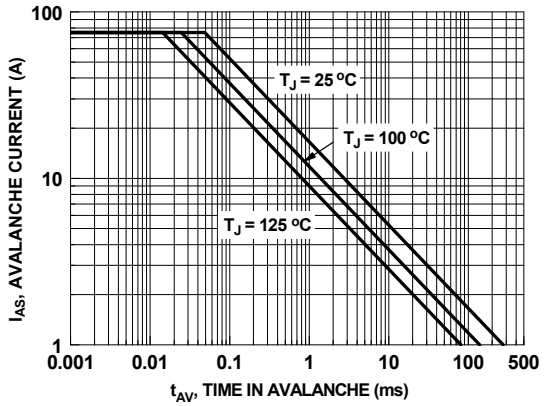


Figure 9. Unclamped Inductive Switching Capability

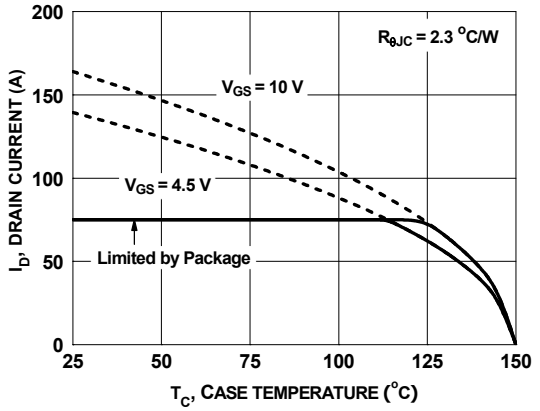


Figure 10. Maximum Continuous Drain Current vs Case Temperature

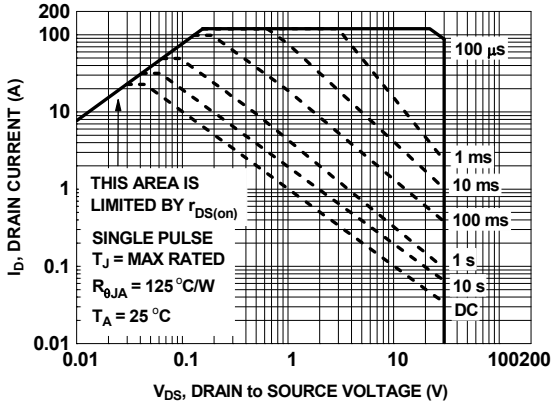


Figure 11. Forward Bias Safe Operating Area

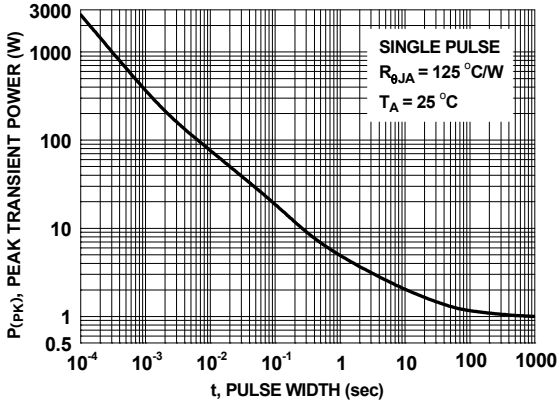


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics T_J = 25°C unless otherwise noted

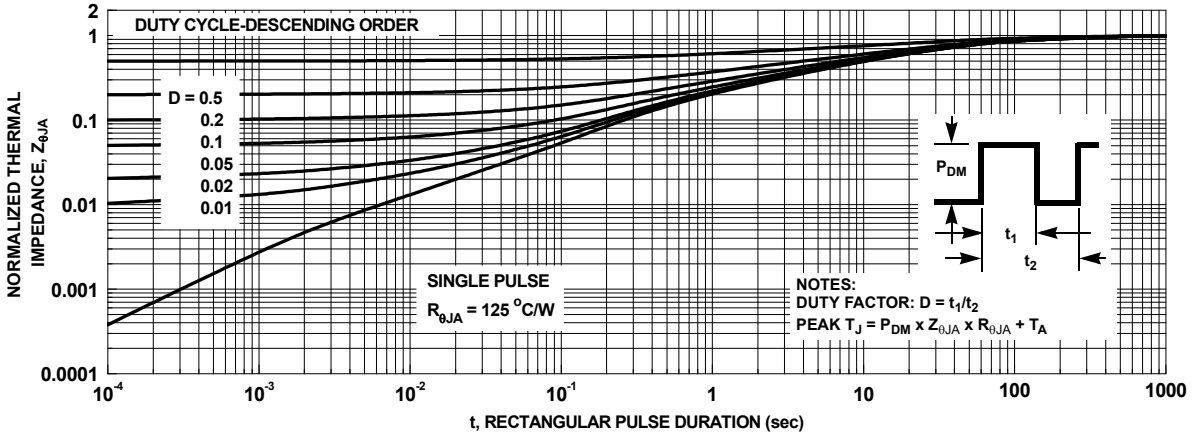
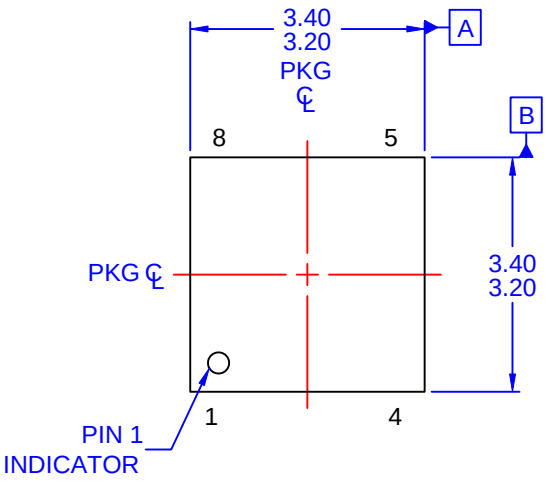
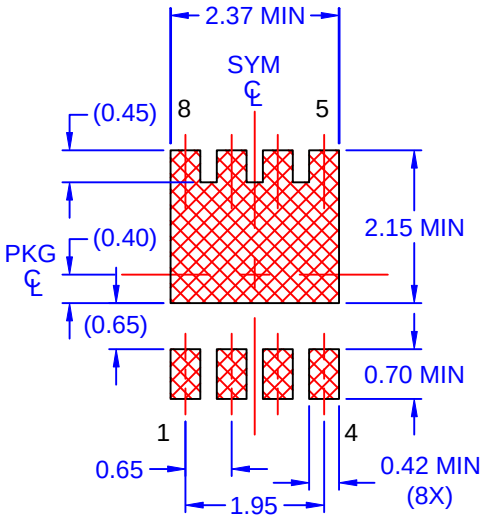
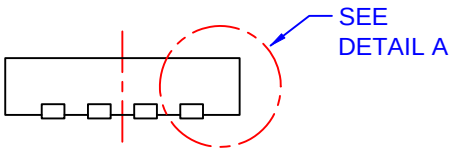


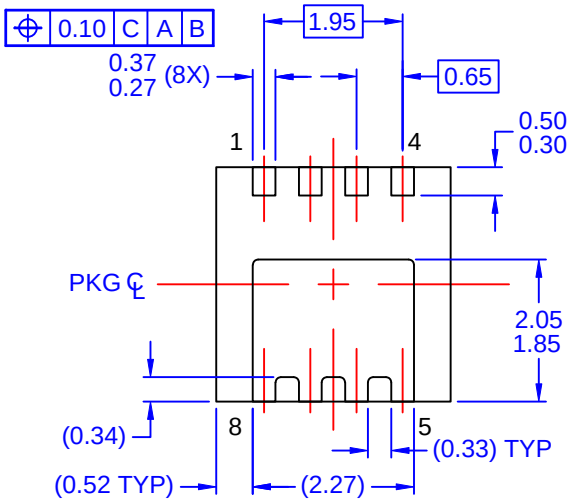
Figure 13. Junction-to-Ambient Transient Thermal Response Curve





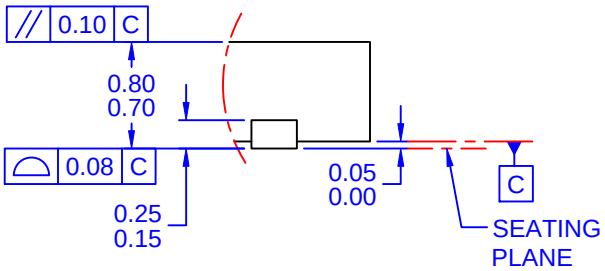
LAND PATTERN
RECOMMENDATION





NOTES: UNLESS OTHERWISE SPECIFIED

A) PACKAGE STANDARD REFERENCE:
JEDEC MO-240, ISSUE A, VAR. BA,
DATED OCTOBER 2002.
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS DO NOT INCLUDE BURRS
OR MOLD FLASH. MOLD FLASH OR
BURRS DOES NOT EXCEED 0.10MM.
D) DIMENSIONING AND TOLERANCING PER
ASME Y14.5M-1994.
E) DRAWING FILE NAME: PQFN08HREV1



DETAIL A
SCALE: 2X

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
Literature Distribution Center for ON Semiconductor
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA
Phone: 303−675−2175 or 800−344−3860 Toll Free USA/Canada
Fax: 303−675−2176 or 800−344−3867 Toll Free USA/Canada
Email: orderlit@onsemi.com

N. American Technical Support: 800−282−9855 Toll Free USA/Canada
Europe, Middle East and Africa Technical Support:
Phone: 421 33 790 2910
Japan Customer Focus Center
Phone: 81−3−5817−1050

ON Semiconductor Website: **www.onsemi.com**

Order Literature: http://www.onsemi.com/orderlit

For additional information, please contact your local Sales Representative

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for MOSFET ***category:***

Click to view products by ON Semiconductor ***manufacturer:***

Other Similar products are found below :

614233C 648584F IRFD120 JANTX2N5237 FCA20N60_F109 FDZ595PZ 2SK2545(Q,T) 405094E 423220D TPCC8103,L1Q(CM MIC4420CM-TR VN1206L SBVS138LT1G 614234A 715780A NTNS3166NZT5G SSM6J414TU,LF(T 751625C BUK954R8-60E NTE6400 SQJ402EP-T1-GE3 2SK2614(TE16L1,Q) 2N7002KW-FAI DMN1017UCP3-7 EFC2J004NUZTDG ECH8691-TL-W FCAB21350L1 P85W28HP2F-7071 DMN1053UCP4-7 NTE221 NTE222 NTE2384 NTE2903 NTE2941 NTE2945 NTE2946 NTE2960 NTE2967 NTE2969 NTE2976 NTE455 NTE6400A NTE2910 NTE2916 NTE2956 NTE2911 DMN2080UCB4-7 TK10A80W,S4X(S SSM6P69NU,LF DMP22D4UFO-7B