ON Semiconductor

Is Now

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

ON Semiconductor®

FDMC010N08C

N-Channel Shielded Gate PowerTrench® MOSFET

80 V, 51 A, 10 mΩ

Features

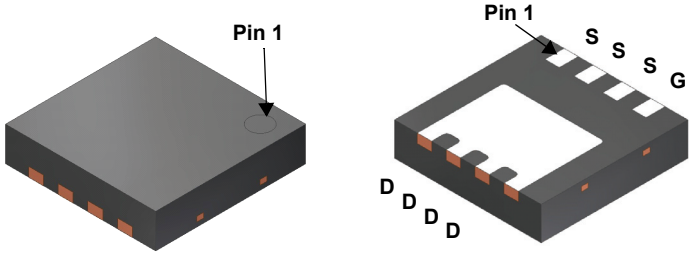
- Shielded Gate MOSFET Technology
- Max $r_{DS(on)}$ = 10 mΩ at V_{GS} = 10 V, I_D = 16 A
- Max $r_{DS(on)}$ = 25 mΩ at V_{GS} = 6 V, I_D = 8 A
- 50% lower Qrr than other MOSFET suppliers
- Lowers switching noise/EMI
- MSL1 robust package design
- 100% UIL tested
- RoHS Compliant

General Description

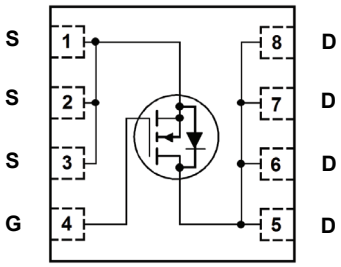
This N-Channel MV MOSFET is produced using ON Semiconductor's advanced PowerTrench® process that incorporates Shielded Gate technology. This process has been optimized to minimise on-state resistance and yet maintain superior switching performance with best in class soft body diode.

Applications

- Primary DC-DC MOSFET
- Synchronous Rectifier in DC-DC and AC-DC
- Motor Drive
- Solar



Top Power 33 Bottom



MOSFET Maximum Ratings T_A = 25 °C unless otherwise noted

Symbol	Parameter			Ratings	Units
V_{DS}	Drain to Source Voltage			80	V
V_{GS}	Gate to Source Voltage			±20	V
I_D	Drain Current -Continuous	T_C = 25 °C	(Note 5)	51	A
	-Continuous	T_C = 100 °C	(Note 5)	32	
	-Continuous	T_A = 25 °C	(Note 1a)	11	
	-Pulsed		(Note 4)	206	
E_{AS}	Single Pulse Avalanche Energy		(Note 3)	96	mJ
P_D	Power Dissipation	T_C = 25 °C		52	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	2.4	°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
FDMC010N08C	FDMC010N08C	Power 33	13 ”	12 mm	3000 units

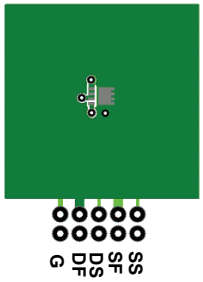
Semiconductor Components Industries, LLC, 2017
August, 2017, Rev. 1.0

Publication Order Number:
FDMC010N08C/D

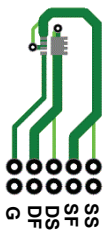
Electrical Characteristics T_J = 25 °C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain to Source Breakdown Voltage	I_D = 250 μA, V_{GS} = 0 V	80			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, referenced to 25 °C		75		mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 64 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 = 90 μA	2.0	2.9	4.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	I_D = 90 μA, referenced to 25 °C		-8		mV/°C
$r_{DS(on)}$	Static Drain to Source On Resistance	V_{GS} = 10 V, I_D = 16 A		8.0	10	mΩ
		V_{GS} = 6 V, I_D = 8 A		12.3	25	
		V_{GS} = 10 V, I_D = 16 A, T_J = 125 °C		14	18	
g_{FS}	Forward Transconductance	V_{DS} = 5 V, I_D = 16 A		35		S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 40 V, V_{GS} = 0 V, f = 1 MHz		1070	1500	pF
C_{oss}	Output Capacitance			381	530	pF
C_{rss}	Reverse Transfer Capacitance			20	30	pF
R_g	Gate Resistance		0.1	0.4	0.7	Ω
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 40 V, I_D = 16 A, V_{GS} = 10 V, R_{GEN} = 6 Ω		9	19	ns
t_r	Rise Time			3	10	ns
$t_{d(off)}$	Turn-Off Delay Time			17	31	ns
t_f	Fall Time			5	10	ns
Q_g	Total Gate Charge	V_{GS} = 0 V to 10 V; V_{DD} = 40 V, I_D = 16 A		15	22	nC
Q_g	Total Gate Charge	V_{GS} = 0 V to 6 V; V_{DD} = 40 V, I_D = 16 A		10	14	nC
Q_{gs}	Gate to Source Charge	V_{DD} = 40 V, I_D = 16 A		5		nC
Q_{gd}	Gate to Drain “Miller” Charge	V_{DD} = 40 V, I_D = 16 A		3		nC
Q_{oss}	Output Charge	V_{DD} = 40 V, V_{GS} = 0 V		22.1		nC
Q_{sync}	Total Gate Charge Sync	V_{DS} = 0 V, I_D = 16 A		13.3		nC
Drain-Source Diode Characteristics						
V_{SD}	Source to Drain Diode Forward Voltage	V_{GS} = 0 V, I_S = 2 A (Note 2)		0.7	1.2	V
		V_{GS} = 0 V, I_S = 16 A (Note 2)		0.8	1.3	
t_{rr}	Reverse Recovery Time	I_F = 8 A, di/dt = 300 A/μs		17	30	ns
Q_{rr}	Reverse Recovery Charge			20	33	nC
t_{rr}	Reverse Recovery Time	I_F = 8 A, di/dt = 1000 A/μs		13	23	ns
Q_{rr}	Reverse Recovery Charge			45	73	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. $R_{\theta CA}$ 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 96 mJ is based on starting T_J = 25 °C, L = 3 mH, I_{AS} = 8 A, V_{DD} = 72 V, V_{GS} = 10 V, 100% test at L = 0.1 mH, I_{AS} = 25 A.
4. Pulsed Id please refer to Fig 11 SOA graph for more details.
5. Computed continuous current limited to Max Junction Temperature only, actual continuous current will be limited by thermal & electro-mechanical application board design.

Typical Characteristics T_J = 25 °C unless otherwise noted.

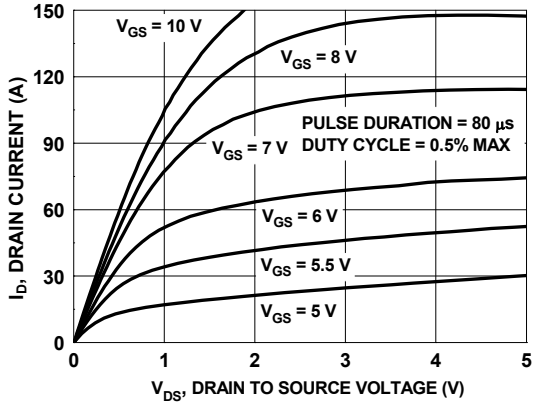


Figure 1. On Region Characteristics

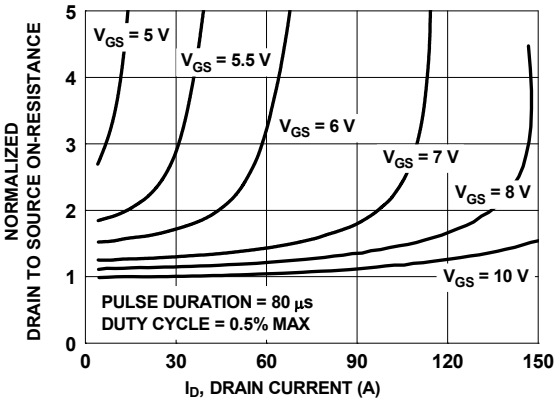


Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage

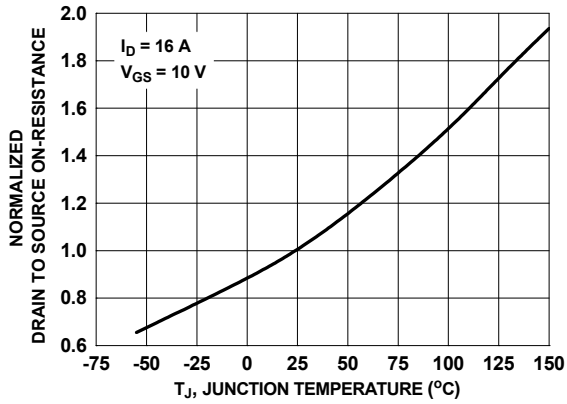


Figure 3. Normalized On Resistance vs. Junction Temperature

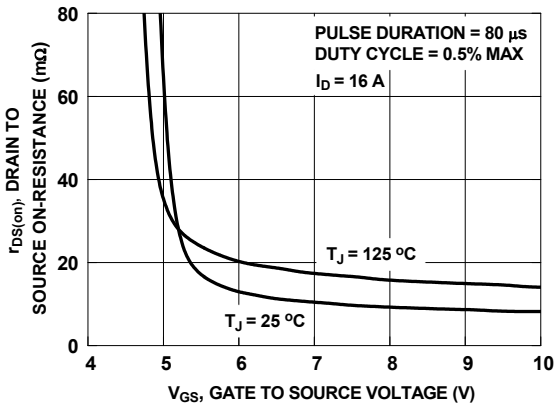


Figure 4. On-Resistance vs. Gate to Source Voltage

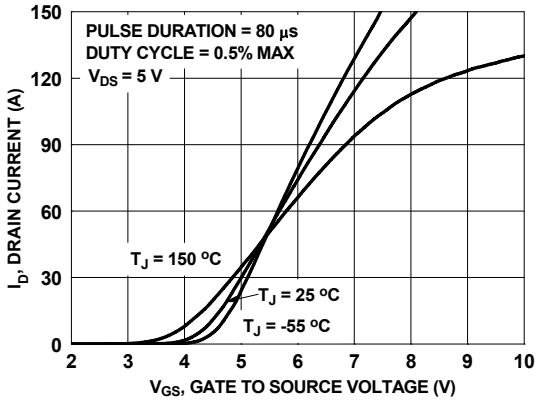


Figure 5. Transfer Characteristics

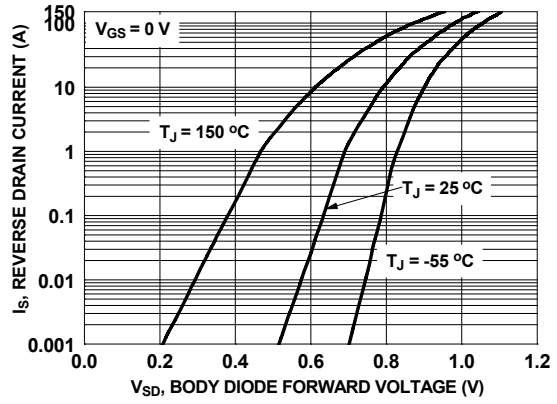


Figure 6. Source to Drain Diode Forward Voltage vs. Source Current

Typical Characteristics T_J = 25 °C unless otherwise noted.

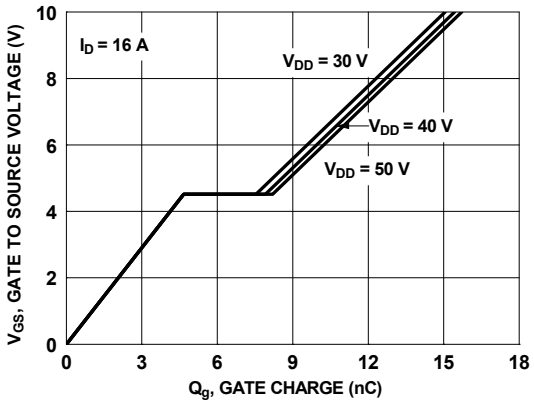


Figure 7. Gate Charge Characteristics

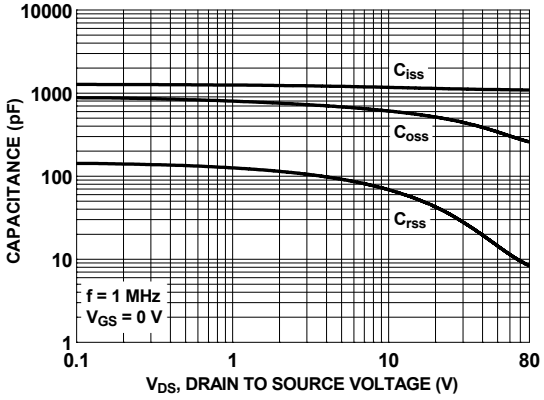


Figure 8. Capacitance vs. Drain to Source Voltage

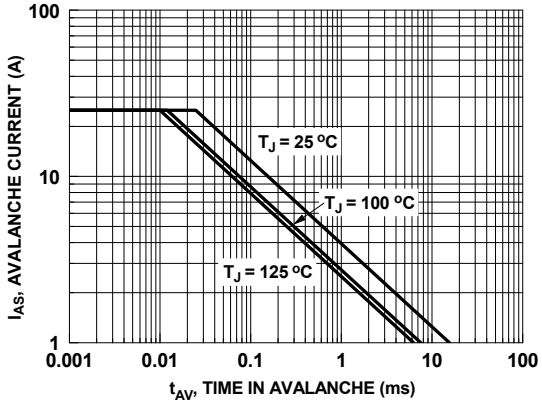


Figure 9. Unclamped Inductive Switching Capability

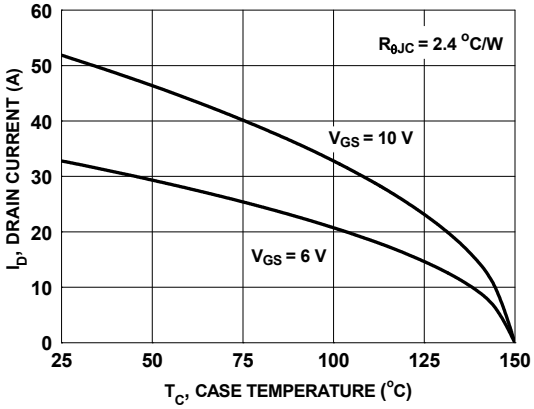


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

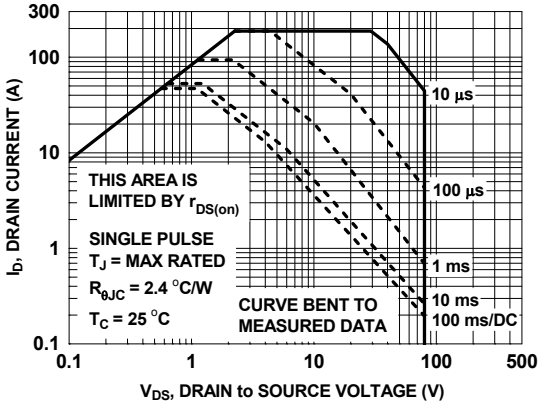


Figure 11. Forward Bias Safe Operating Area

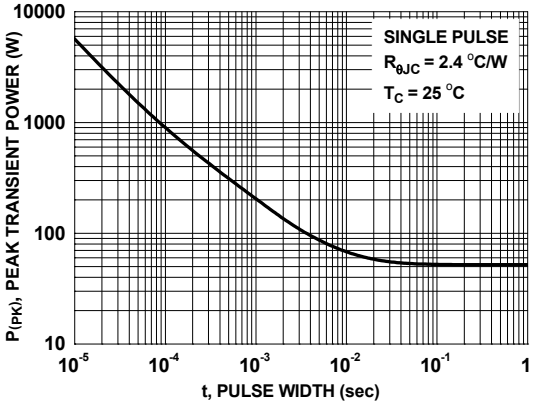


Figure 12. Single Pulse Maximum Power Dissipation

Typical Characteristics T_J = 25 °C unless otherwise noted.

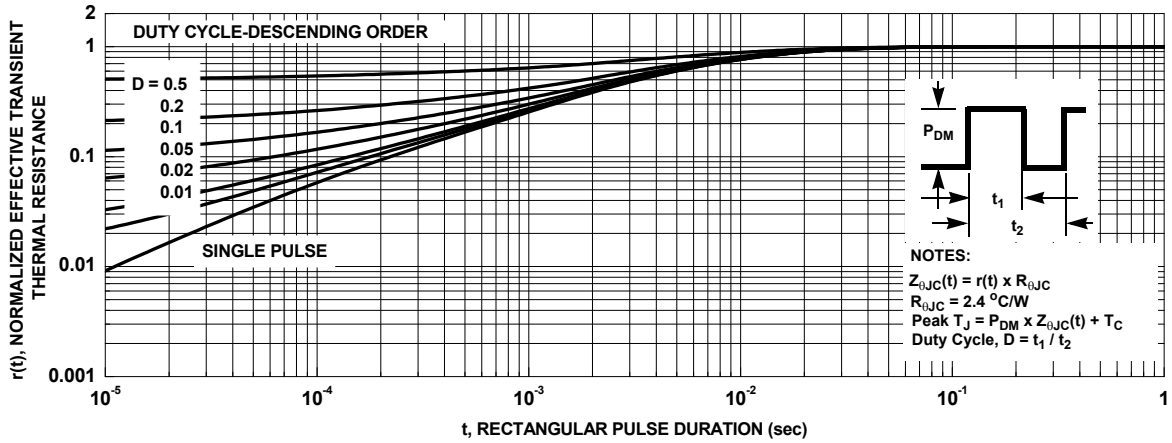
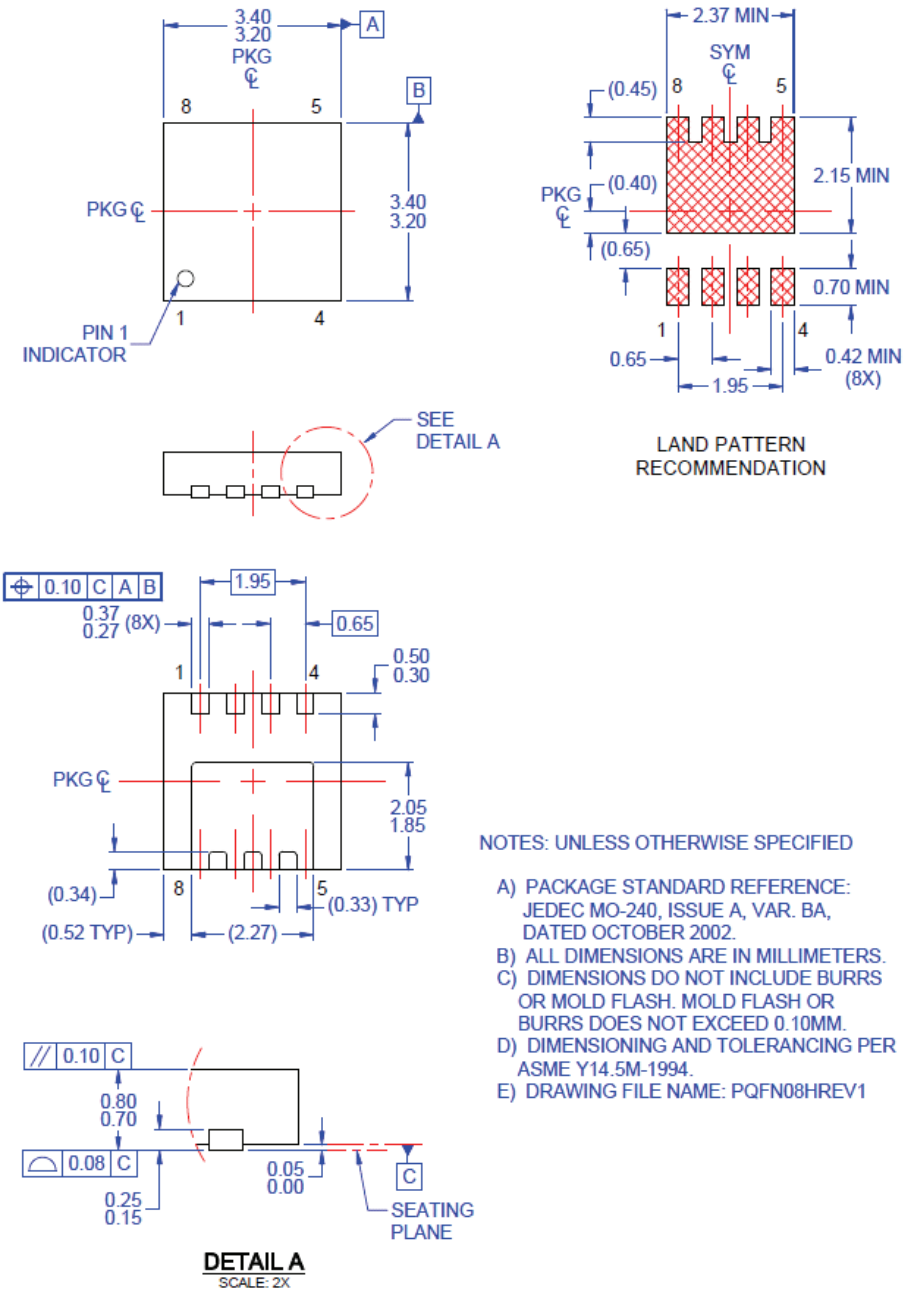


Figure 13. Junction-to-Case Transient Thermal Response Curve

Dimensional Outline and Pad Layout



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

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