Lonten N-channel 650V, 40A, 0.105Ω LonFET™ Power MOSFET

Description

LonFET™ Power MOSFET is fabricated using advanced super junction technology. The resulting device has extremely low on resistance, making it especially suitable for applications which require superior power density and outstanding efficiency.

Features

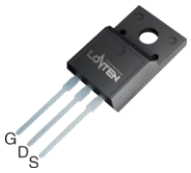
- Ultra low $R_{DS(on)}$
- Ultra low gate charge (typ. Q_g = 49.8nC)
- 100% UIS tested
- RoHS compliant

Applications

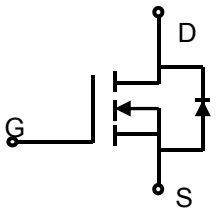
- Power factor correction (PFC).
- Switched mode power supplies (SMPS).
- Uninterruptible power supply (UPS).

Product Summary

V_{DS} @ $T_{j,max}$	700V
$R_{DS(on),max}$	0.105Ω
I_{DM}	120A
$Q_{g,typ}$	49.8nC



TO-220F



N-Channel MOSFET

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	650	V
Continuous drain current (T_C = 25°C)	I_D	40	A
(T_C = 100°C)		26	A
Pulsed drain current [1]	I_{DM}	120	A
Gate-Source voltage	V_{GSS}	±30	V
Avalanche energy, single pulse [2]	E_{AS}	1000	mJ
Power Dissipation (T_C = 25°C)	P_D	34.8	W
- Derate above 25°C		0.28	W/°C
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C
Continuous diode forward current	I_S	40	A
Diode pulse current	$I_{S,pulse}$	120	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.6	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Soldering temperature, wavesoldering only allowed at leads. (1.6mm from case for 10s)	T_{sold}	260	°C

Package Marking and Ordering Information

Device	Device Package	Marking	Units/Tube
LSD65R105HF	TO-220F	LSD65R105HF	50

Electrical Characteristics

T_c = 25°C unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	V_{GS}=0 V, I_D=0.25 mA	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=0.25 mA	3.0	3.5	4.5	V
Drain cut-off current	I_{DSS}	V_{DS}=650V, V_{GS}=0 V,T_j = 25°C	-	-	5	μA
Gate leakage current, Forward	I_{GSSF}	V_{GS}=30 V, V_{DS}=0 V	-	-	100	nA
Gate leakage current, Reverse	I_{GSSR}	V_{GS}=-30 V, V_{DS}=0 V	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(on)}$	V_{GS}=10 V, I_D=20 A T_j = 25°C T_j = 150°C	- - -	 0.096 0.25	 0.105 -	Ω
Gate resistance	R_G	f=1 MHz, open drain	-	2.0	-	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} = 100 V, V_{GS} = 0 V,	-	2870	-	pF
Output capacitance	C_{oss}	f = 250 kHz	-	104	-	
Reverse transfer capacitance	C_{rss}		-	2.2	-	
Turn-on delay time	$t_{d(on)}$	V_{DD} = 400 V, I_D = 20 A	-	29.8	-	ns
Rise time	t_r	R_G = 10 Ω, V_{GS}=10 V	-	59.2	-	
Turn-off delay time	$t_{d(off)}$		-	63.5	-	
Fall time	t_f		-	4.4	-	
Gate charge characteristics						
Gate to source charge	Q_{gs}	V_{DD}=520 V, I_D=20 A,	-	16.3	-	nC
Gate to drain charge	Q_{gd}	V_{GS}=0 to 10 V	-	11.1	-	
Gate charge total	Q_g		-	49.8	-	
Gate plateau voltage	$V_{plateau}$		-	5.0	-	V
Reverse diode characteristics						
Diode forward voltage	V_{SD}	V_{GS}=0 V, I_F=20 A	-	-	1.2	V
Reverse recovery time	t_{rr}	V_R=400 V, I_F=20 A,	-	184.0	-	ns
Reverse recovery charge	Q_{rr}	dI_F/dt=100 A/μs	-	1.5	-	μC
Peak reverse recovery current	I_{rrm}		-	16.7	-	A

Notes:

1. Limited by maximum junction temperature, maximum duty cycle is 0.75.

2. I_{AS} = 8A, V_{DD} =50V, RG=30Ω, Starting T_j= 25°C.

Electrical Characteristics Diagrams

Figure 1. On-Region Characteristics

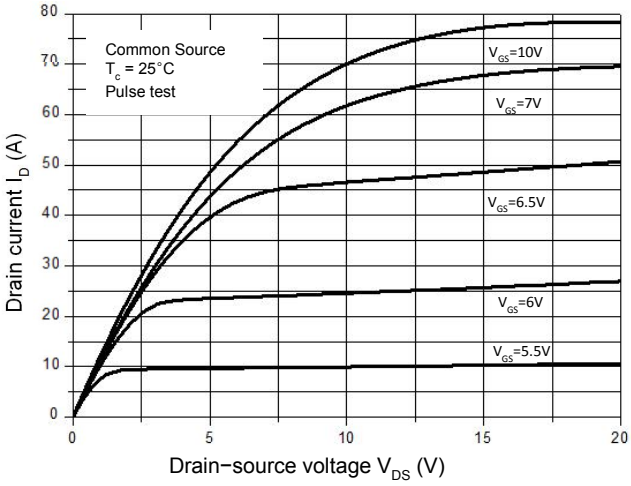


Figure 2. Transfer Characteristics

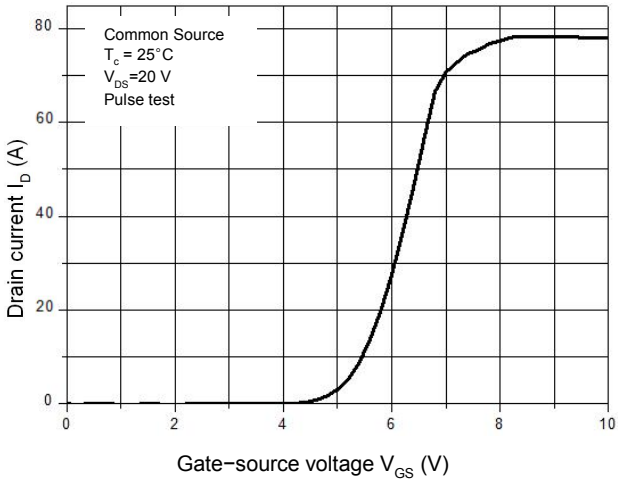


Figure 3. On-Resistance Variation vs. Drain Current

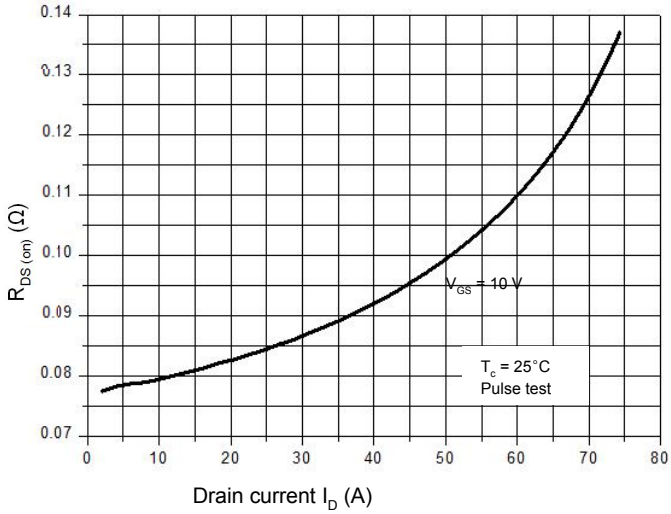


Figure 4. Threshold Voltage vs. Temperature

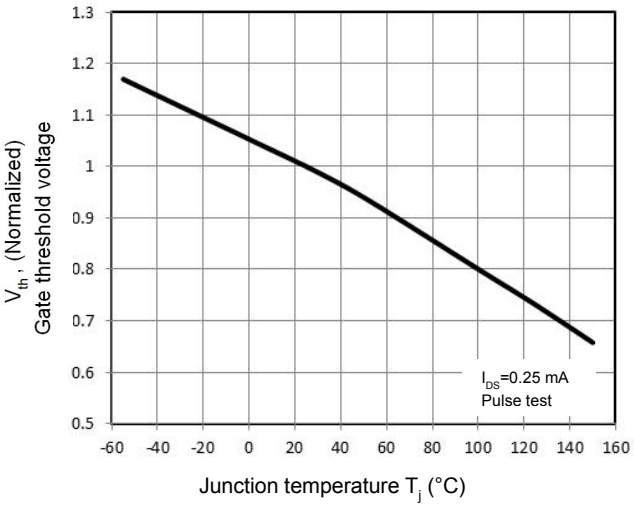


Figure 5. Breakdown Voltage vs. Temperature

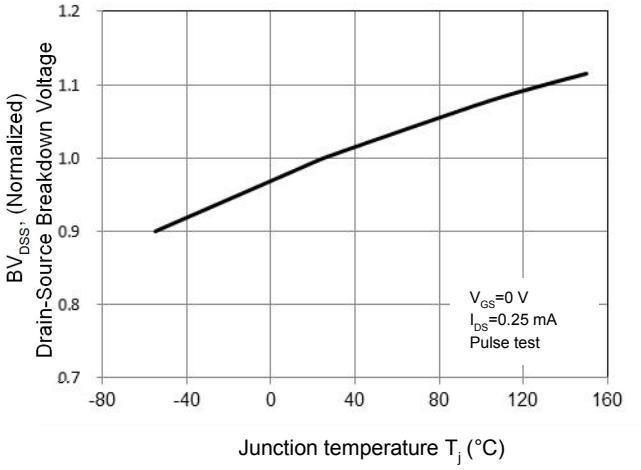


Figure 6. On-Resistance vs. Temperature

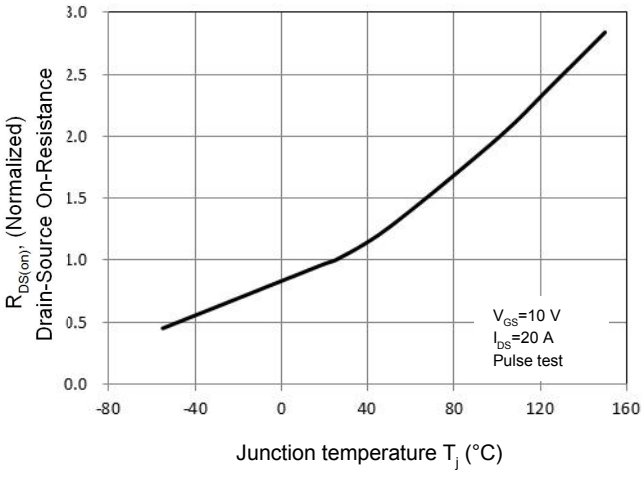


Figure 7. Capacitance Characteristics

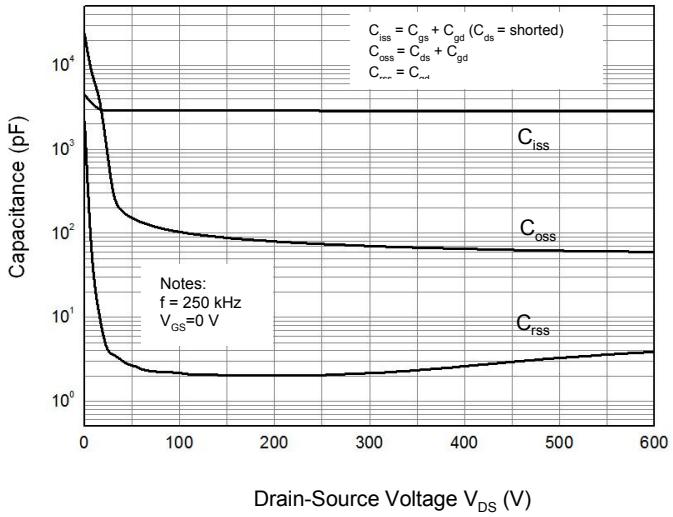


Figure 8. Gate Charge Characteristics

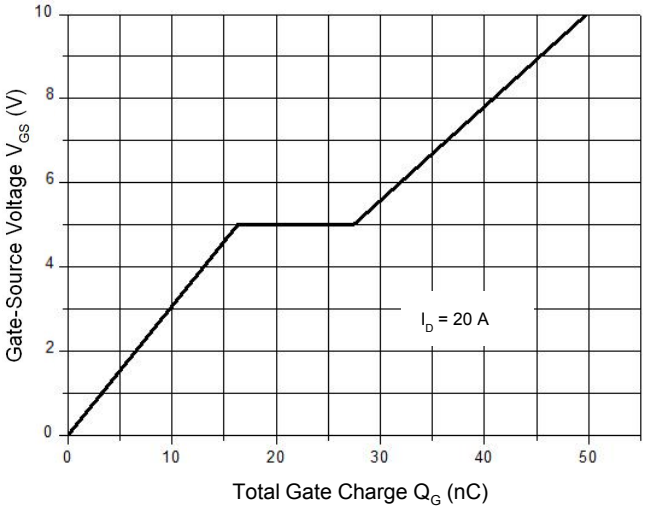


Figure 9.Power Dissipation vs. Temperature

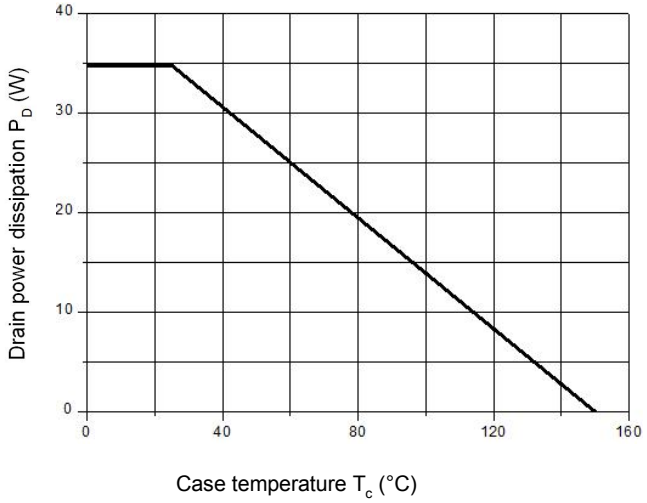


Figure 10.Drain Current Derating

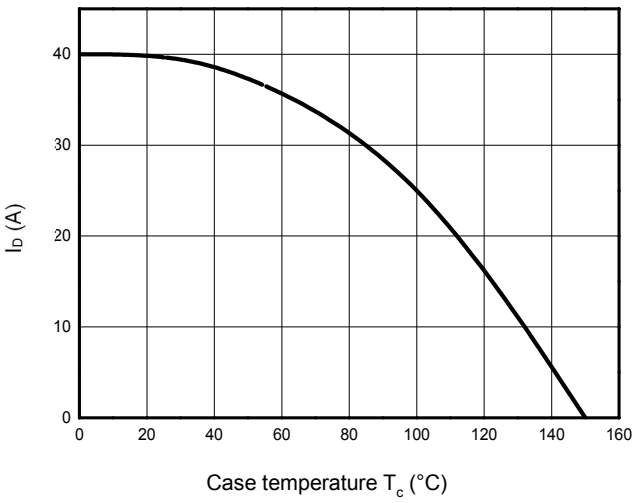
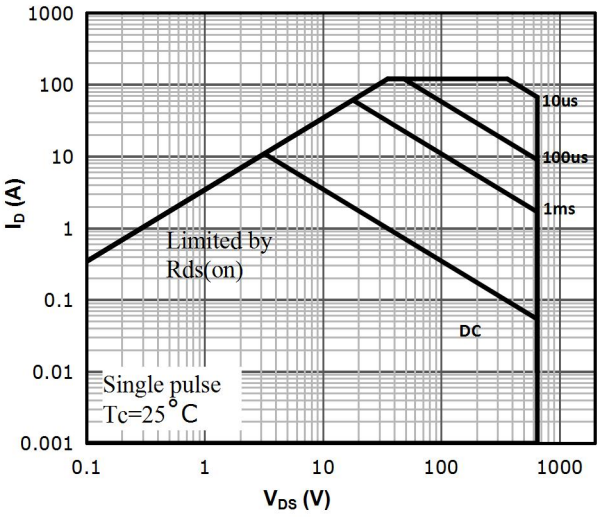
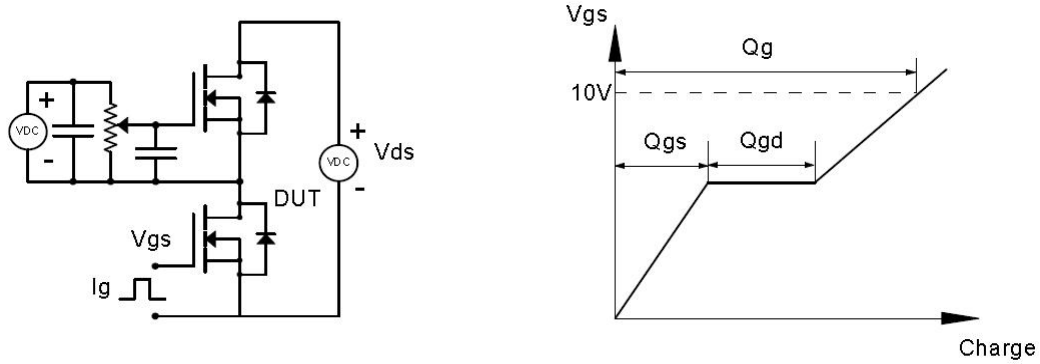


Figure 11: Safe Operating Area

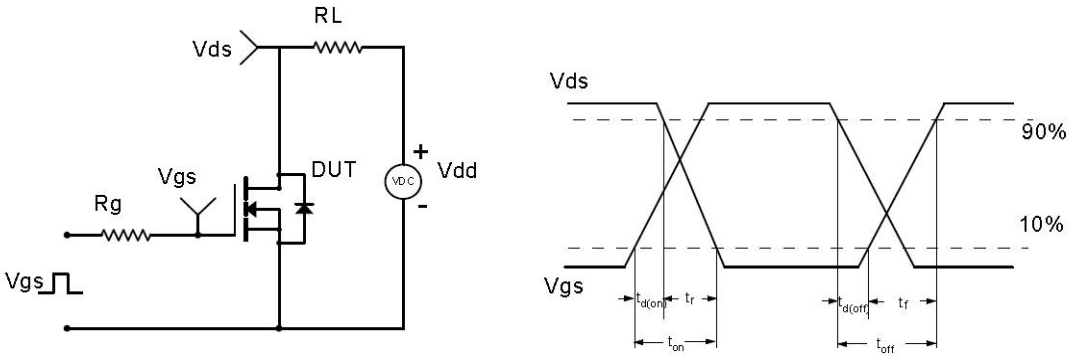


Test Circuit & Waveforms

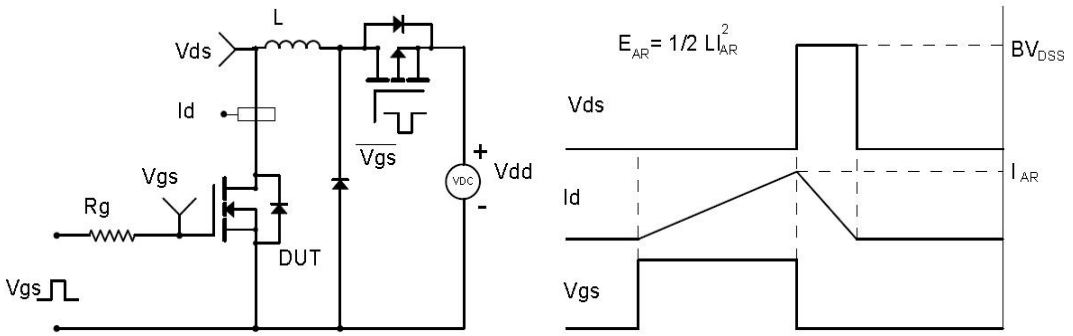
Gate Charge Test Circuit & Waveform



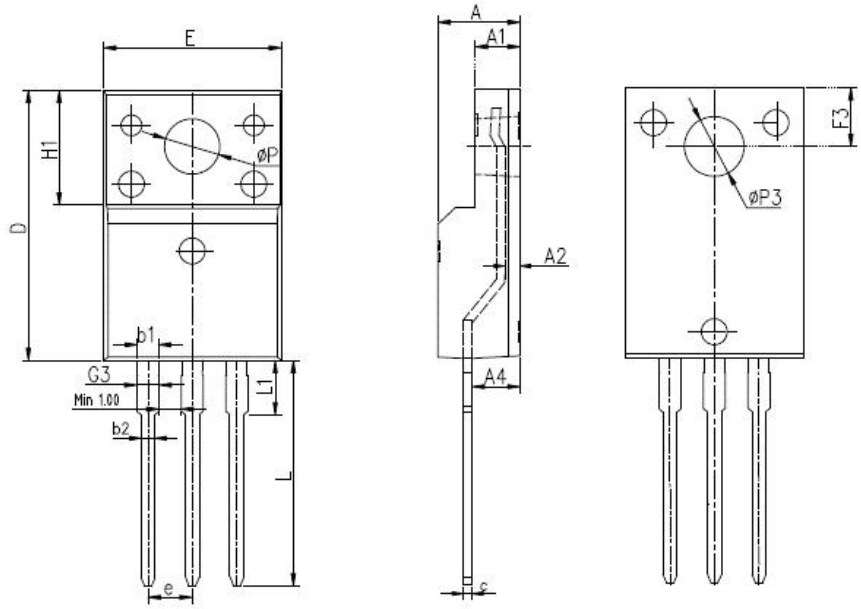
Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Mechanical Dimensions for TO-220F



DIMENSIONS IN MILLITMETERS			DIMENSIONS IN INCHES	
SYMBOL	MIN	MAX	MIN	MAX
A	4.4	4.9	0.173	0.193
A1	2.34	2.74	0.092	0.108
A2	0.3	0.7	0.012	0.028
A4	2.5	2.96	0.098	0.117
c	0.4	0.7	0.016	0.028
D	15.57	16.4	0.613	0.646
E	9.96	10.4	0.392	0.409
H1	6.48	6.95	0.255	0.274
e	2.54BSC		0.1BSC	
L	12.68	14.2	0.499	0.559
L1	2.88	3.6	0.113	0.142
ΦP	3	3.38	0.118	0.133
ΦP3	3.15	3.65	0.124	0.144
F3	3.15	3.45	0.124	0.136
G3	1.15	1.58	0.045	0.062
b1	1.18	1.43	0.046	0.056
b2	0.7	1	0.028	0.039

Disclaimer

The content specified herein is for the purpose of introducing LONTEN's products (hereinafter "Products"). The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

LONTEN does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of the Products or technical information described in this document.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). LONTEN shall bear no responsibility in any way for use of any of the Products for the above special purposes.

Although LONTEN endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a LONTEN product.

The content specified herein is subject to change for improvement without notice. When using a LONTEN product, be sure to obtain the latest specifications.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

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

Click to view products by LONTEN ***manufacturer:***

Other Similar products are found below :

614233C 648584F MCH3443-TL-E MCH6422-TL-E FDPF9N50NZ FW216A-TL-2W FW231A-TL-E APT5010JVR NTNS3A92PZT5G IRF100S201 JANTX2N5237 2SK2464-TL-E 2SK3818-DL-E FCA20N60_F109 FDZ595PZ STD6600NT4G FSS804-TL-E 2SJ277-DL-E 2SK1691-DL-E 2SK2545(Q,T) D2294UK 405094E 423220D MCH6646-TL-E TPCC8103,L1Q(CM 367-8430-0972-503 VN1206L 424134F 026935X 051075F SBVS138LT1G 614234A 715780A NTNS3166NZT5G 751625C 873612G IRF7380TRHR IPS70R2K0CEAKMA1 RJK60S3DPP-E0#T2 RJK60S5DPK-M0#T0 APT5010JVFR APT12031JFLL APT12040JVR DMN3404LQ-7 NTE6400 JANTX2N6796U JANTX2N6784U JANTXV2N5416U4 SQM110N05-06L-GE3 SIHF35N60E-GE3