Features

- Split Gate Trench MOSFET Technology
- High Density Cell Design For Low $R_{DS(on)}$
- Moisture Sensitivity Level 1
- Halogen Free. “Green” Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

N-CHANNEL MOSFET

Maximum Ratings

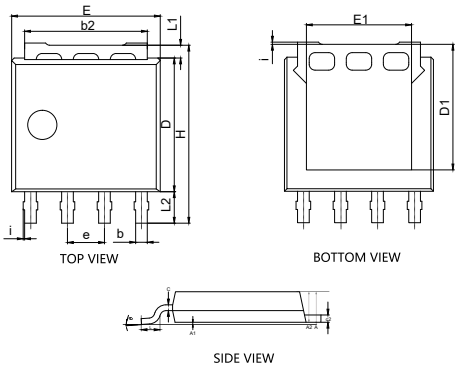
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 50°C/W Junction to Ambient(Note 2)
- Thermal Resistance: 0.65°C/W Junction to Case

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Volltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	320	A
	T_C=100°C		226	
Pulsed Drain Current (Note 3)		I_{DM}	1280	A
Total Power Dissipation (Note 4)		P_D	230	W
Avalanche Energy (Note 5)		E_{AS}	441	mJ

Note:

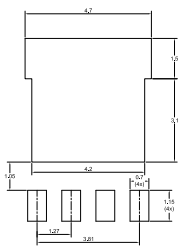
1. Halogen free "Green” products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of RθJA is measured with the device mounted on 1 in ² FR-4 board with 2oz. copper, in a still air environment with TA=25°C.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. Tj=25°C,V_{DD}=30V, R_G=25Ω,V_{GS}=10V,L=0.5mH.

LFPAK56E



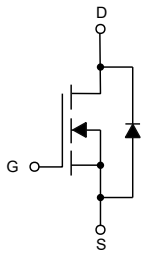
DIMENSIONS					
DIM	INCHES		Millimeter		NOTE
	MIN	MAX	MIN	MAX	
A	0.039	0.051	1.00	1.30	
A1	0.000	0.006	0.00	0.15	
A2	0.039	0.044	0.98	1.12	
b	0.014	0.020	0.35	0.50	
b2	0.158	0.174	4.02	4.41	
c	0.007	0.010	0.19	0.25	
c2	0.009	0.012	0.24	0.30	
D	0.175	0.185	4.45	4.70	
D1		0.175		4.45	
E	0.195	0.209	4.95	5.30	
E1	0.138	0.146	3.50	3.70	
e	0.050		1.27		TYP
H	0.234	0.246	5.95	6.25	
i		0.010		0.25	
L	0.016	0.033	0.40	0.85	
L1	0.011	0.022	0.27	0.57	
L2	0.031	0.051	0.80	1.30	
θ	0°	8°	0°	8°	

Suggested Solder Pad Layout

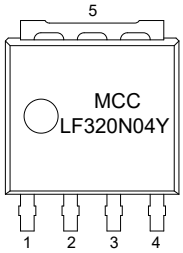


Unit:mm

Internal Structure and Marking Code



1,2,3.SOURCE
4. GATE
5. DRAIN



Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=1mA	40			V
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V, V_{GS}=0V			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	2	2.9	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=75A		0.48	0.62	mΩ
		V_{GS}=6V, I_D=20A		1.3	1.9	
Gate Resistance	R_g	f=1MHz， Open drain		3.0		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				320	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=20A			1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F=40A,di/dt=100A/us		83		ns
Body Diode Reverse Recovery charge	Q_{rr}			125		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V,f=1MHz		6485		pF
Output Capacitance	C_{oss}			3365		
Reverse Transfer Capacitance	C_{rss}			129		
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=10V,I_D=75A		80		nC
Gate-Source Charge	Q_{gs}			27.6		
Gate-Drain Charge	Q_{gd}			18.6		
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DS}=20V, R_G=3Ω, I_D=160A		17.5		ns
Turn-On Rise Time	t_r			32		
Turn-Off Delay Time	$t_{d(off)}$			55		
Turn-Off Fall Time	t_f			54		

Curve Characteristics

Fig.1 - Typical Output Characteristics

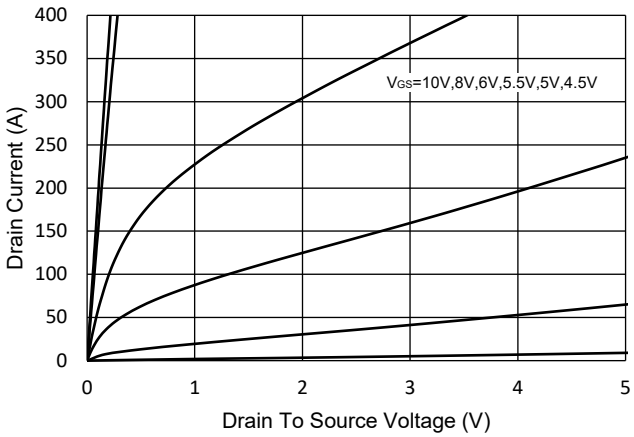


Fig.2 - Transfer Characteristic

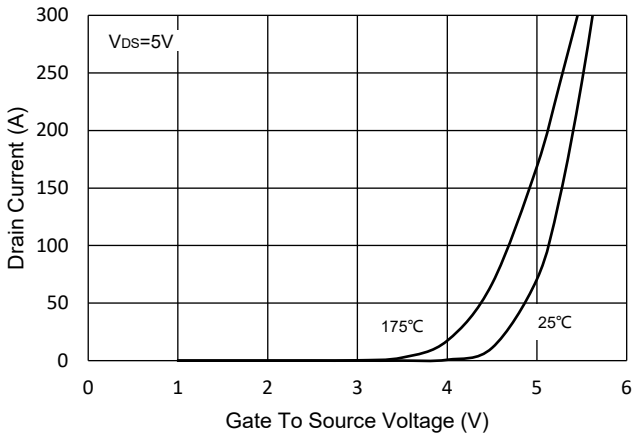


Fig.3 - $R_{DS(ON)}$ - V_{GS}

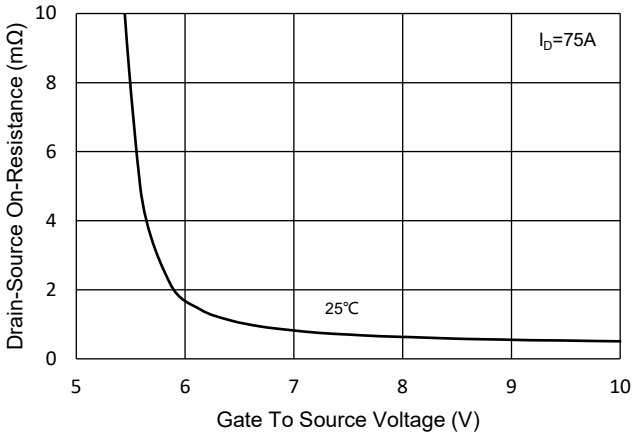


Fig.4 - $R_{DS(ON)}$ - I_D

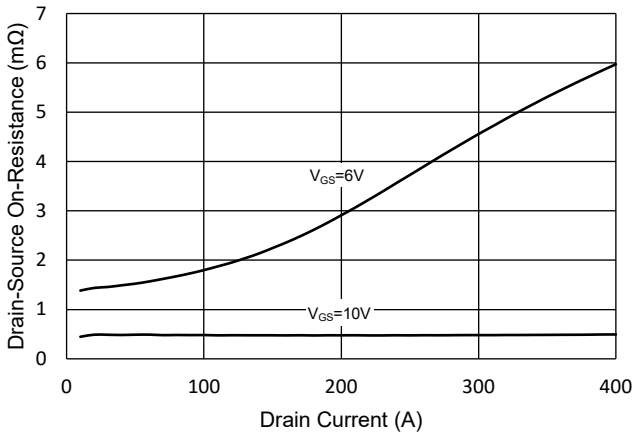


Fig.5 - Capacitance Characteristics

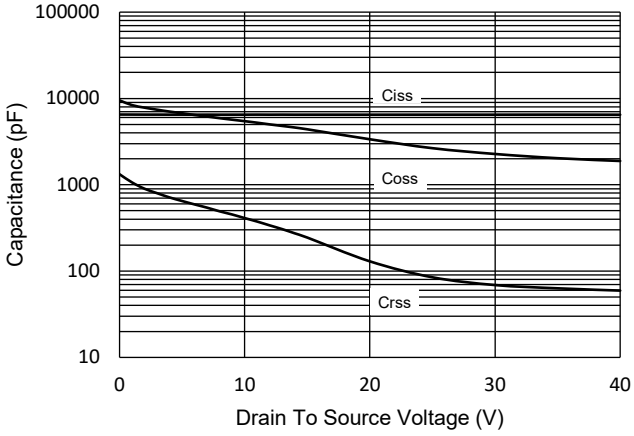
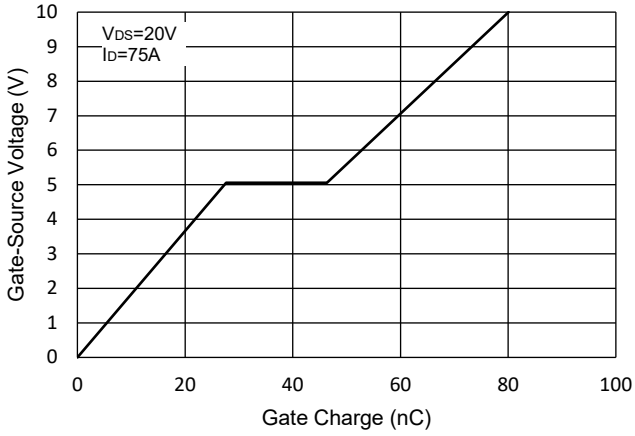


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

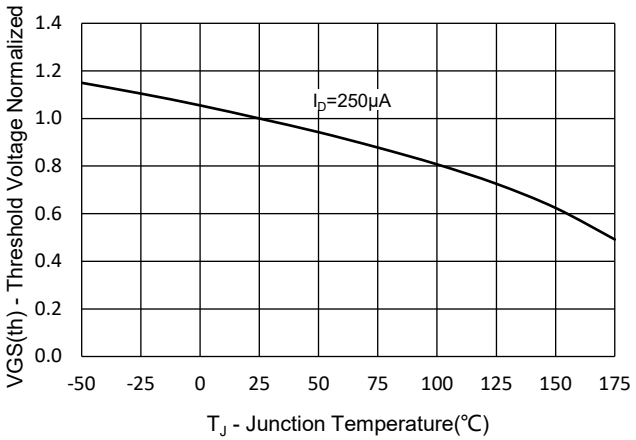


Fig.8 - Normalized On Resistance Characteristics

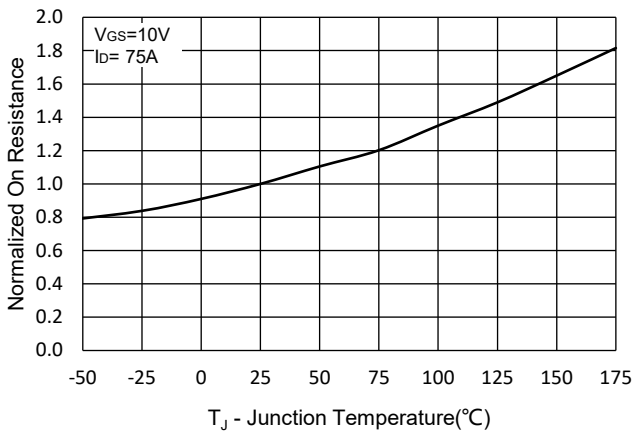


Fig.9 - I_S - V_{SD}

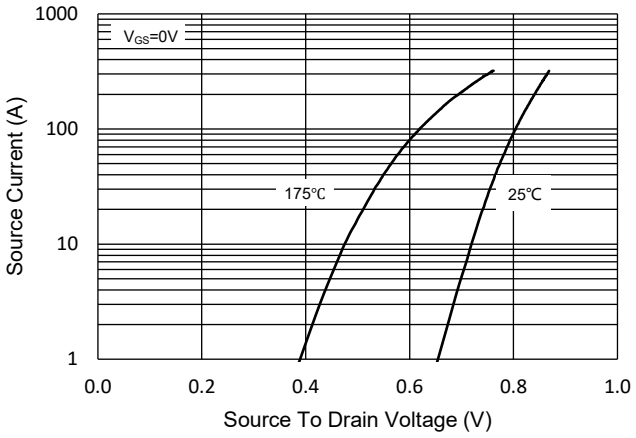


Fig.10 - Drain Current

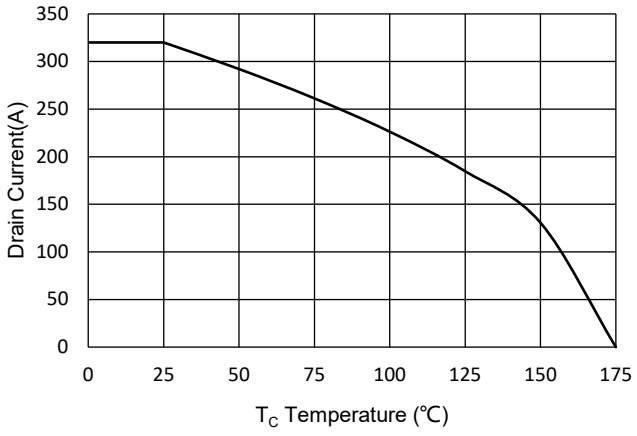
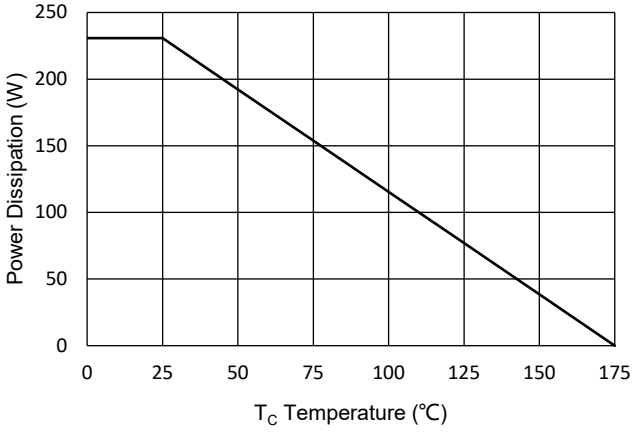


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

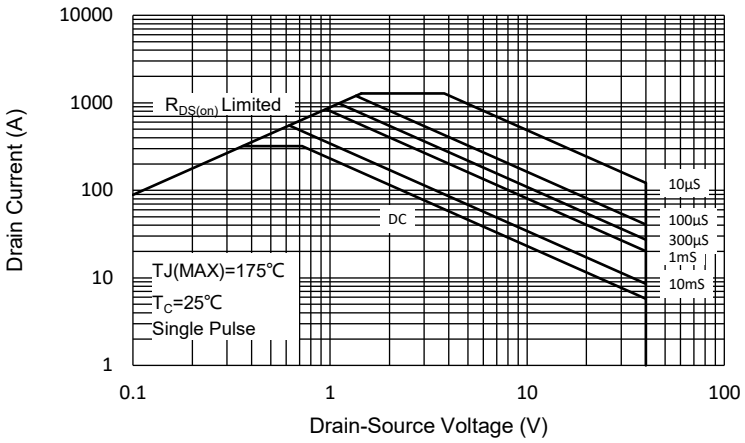
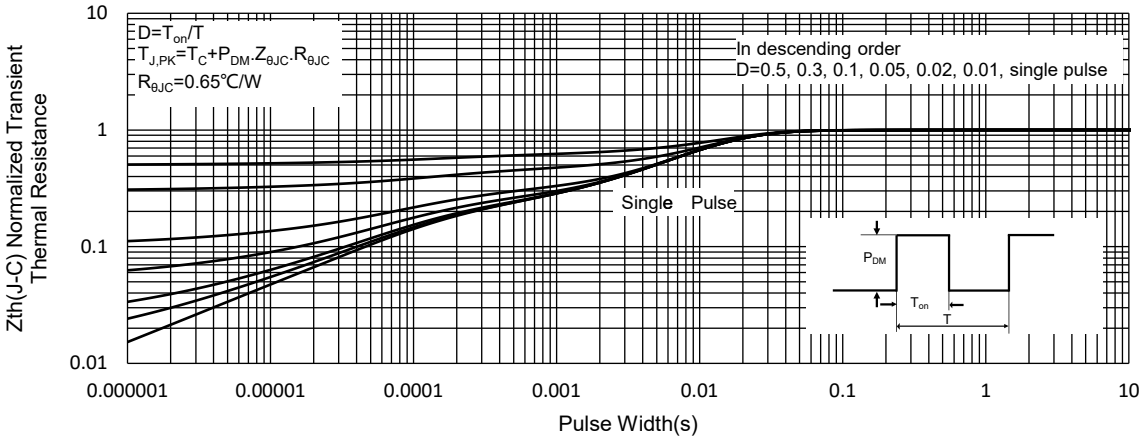


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 5Kpcs/Reel