MS20N06

N-Channel 60-V (D-S) MOSFET

Features:

- Low rDS(on) trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

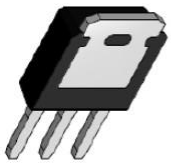
Applications:

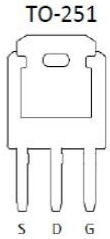
- White LED boost converters
- Automotive Systems
- Industrial DC/DC Conversion Circuits

Packing & Order Information

Part No./ T：2,500/Reel

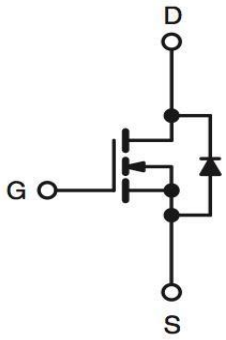
Part No./ R：80/Tube , 4,000/Box

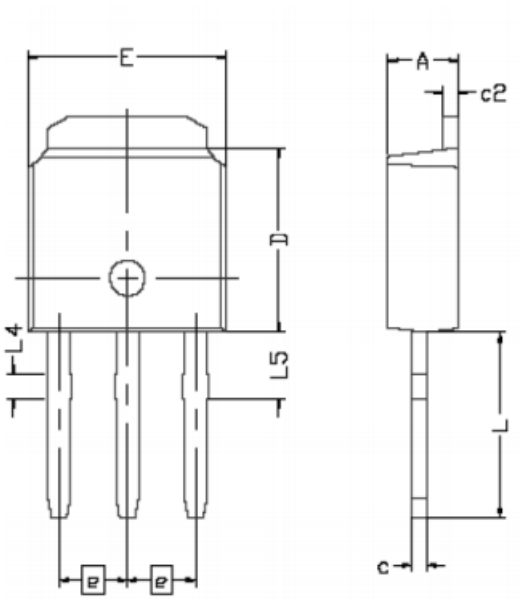


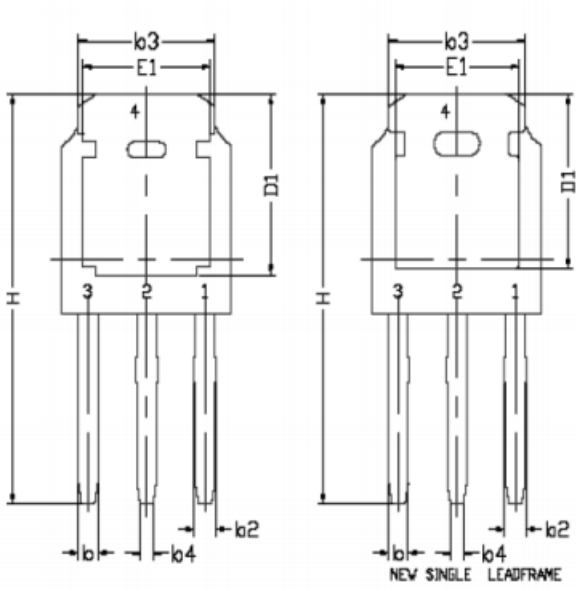


RoHS
COMPLIANT

Graphic symbol







SYMBOL	DIMENSIONAL REQMTS		
	MIN	NOM	MAX
E	6.40	6.60	6.731
L	5.89	6.08	6.28
L4	0.66	0.76	0.86
L5	1.96	2.16	2.36
D	6.00	6.10	6.223
H	12.90	13.20	13.50
b	0.64	0.76	0.88
b2	0.77	0.84	1.14
b3	5.21	5.34	5.46
b4	0.41	0.51	0.61
e	2.286 BSC		
A	2.20	2.30	2.38
c	0.40	0.50	0.60
c2	0.40	0.50	0.60
D1	5.30	--	--
E1	4.40	--	--

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MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Continuous Drain Current[a] (T_A =25°C)	19	A
I_{DM}	Pulsed Drain Current[b]	75	A
I_S	Continuous Source Current (Diode Conduction)[a]	72	A
P_D	Power Dissipation[a] (T_A =25°C)	50	W
T_J/T_{STG}	Operating Junction and Storage Temperature	-55 to +150	°C

Thermal Characteristics

Symbol	Parameter	Maximum	Units
$R_{\theta JC}$	Junction-to-Case	3	°C/W
$R_{\theta JA}$	Junction-to-Ambient[a]	40	

Notes:

a. Surface Mounted on 1” x 1” FR4 Board.

b. Pulse width limited by maximum junction temperature

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
$V_{GS(th)}$	Gate-Threshold Voltage	V_{DS} = V_{GS}, I_D = -250μA	1			V
I_{GSS}	Gate-Body Leakage	V_{DS} = 0 V , V_{GS} = ±20 V			±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 48 V , V_{GS} = 0 V V_{DS} = 48 V , V_{GS} = 0 V , T_J= 55°C			1 25	uA
$I_{D(on)}$	On-State Drain Current[A]	V_{DS} = 5 V, V_{GS} = 10 V	30			A
$r_{DS(on)}$	Drain-Source On-Resistance[A]	V_{GS} = 10 V, I_D = 15.2A V_{GS} = 4.5 V, I_D = 14 A			94 109	mΩ
g_{fs}	Forward Tranconductance[A]	V_{DS} = 15 V, I_D = 15.2 A		20		S
V_{SD}	Diode Forward Voltage	I_S = 21 A, V_{GS} = 0 V		1.03		V

Dynamic[b]

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	V_{DS} = 30 V , I_D = 15.2 A, V_{GS} = 4.5 V		5.1		nC
Q_{gs}	Gate-Source Charge			2.3		nC
Q_{gd}	Gate-Drain Charge			2.0		nC
C_{ISS}	Input Capacitance	V_{DS} = 15 V , f = 1 MHz V_{GS} = 0 V		475		pF
C_{OSS}	Output Capacitance			59		pF
C_{RSS}	Reverse Transfer Capacitance			36		pF

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Dynamic[b]						
Symbol	**Parameter**	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 30 V , R_{GEN} = 6 Ω, V_{GEN} = 10 V , I_D = 15.2 A, R_L = 2 Ω		4		ns
t_r	Rise Time			9		ns
$t_{d(off)}$	Turn-Off Delay Time			17		ns
t_f	Fall Time			19		ns

Notes:

a. Pulse test: PW <= 300us duty cycle <= 2%.

b. Guaranteed by design, not subject to production testing.

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■Characteristics Curve

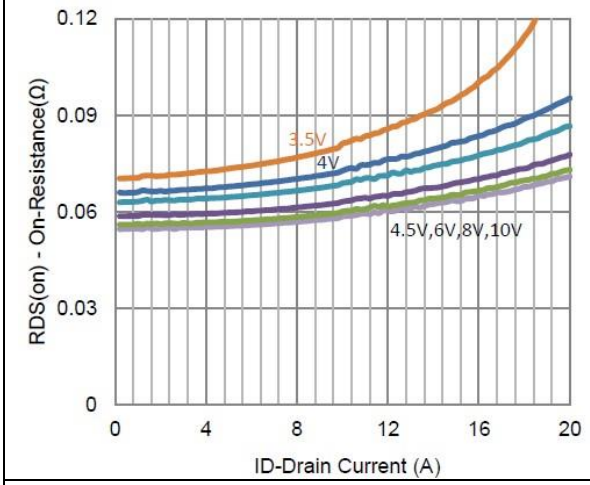

FIG.1-ON-RESISTANCE VS. DRAIN CURRENT

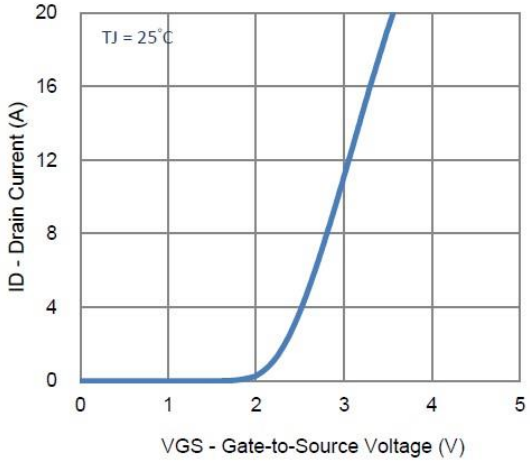

FIG.2-TRANSFER CHARACTERISTICS

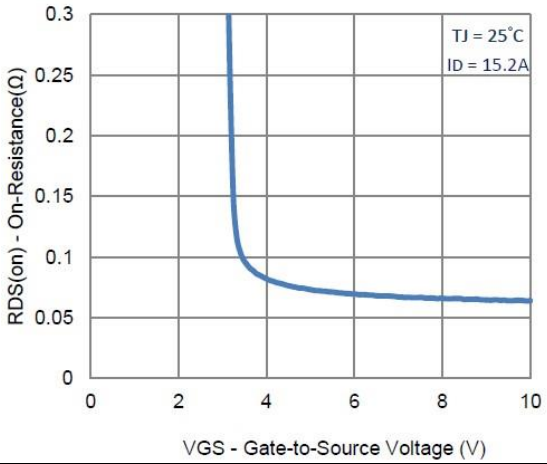

FIG.3-ON-RESISTANCE VS. GATE-TO-SOURCE VOLTAGE

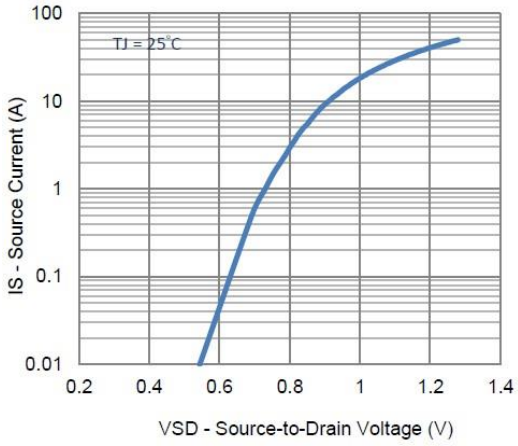

FIG.4-DRAIN-TO-SOURCE FORWARD VOLTAGE

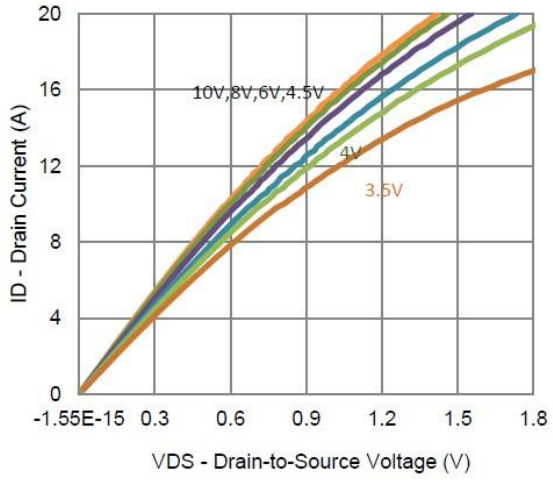

FIG.5-OUTPUT CHARACTERISTICS

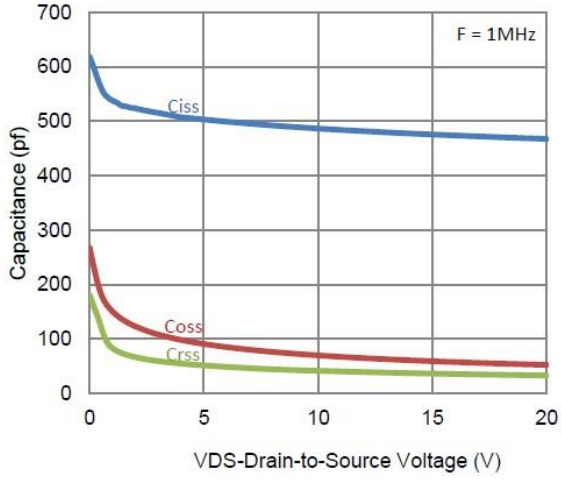

FIG.6-CAPACITANCE

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■Characteristics Curve

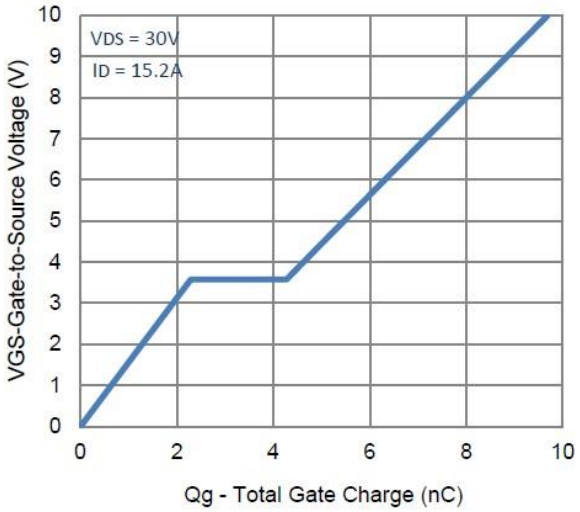

FIG.7-GATE CHARGE

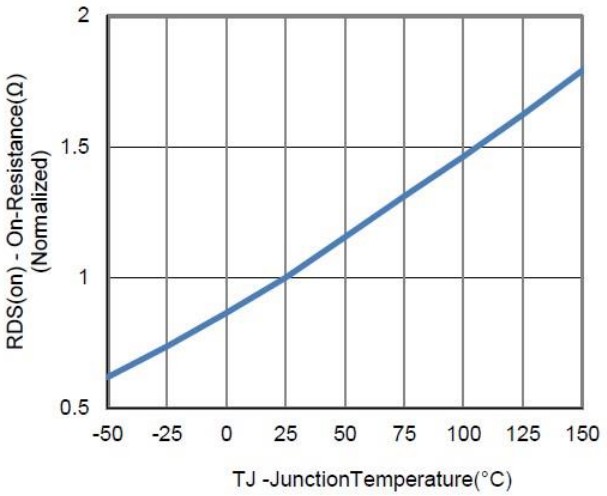

FIG.8-NORMALIZED ON-RESISTANCE VS. JUNCTION TEMPERATURE

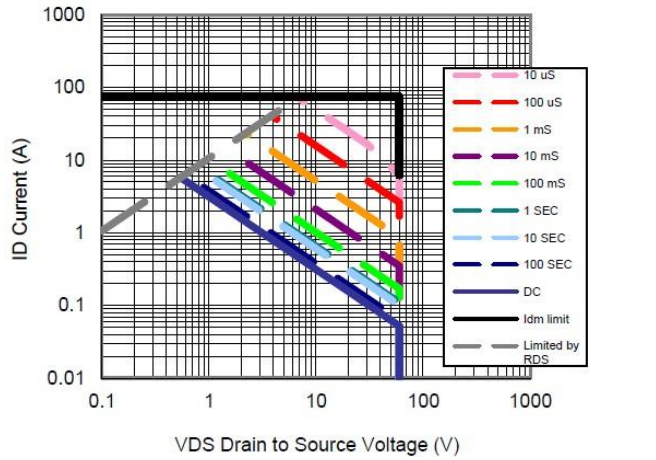

FIG.9-SAFE OPERATING AREA

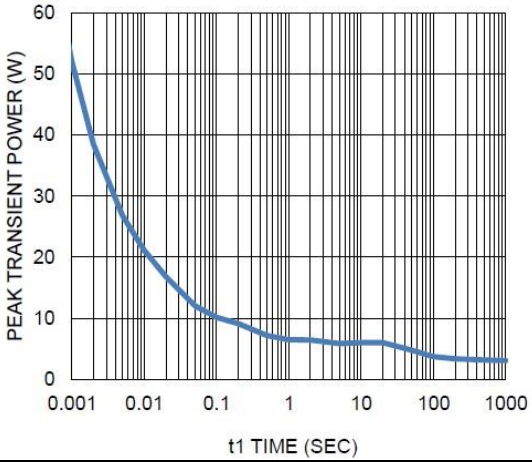

FIG.10-SINGLE PULSE MAXIMUM POWER DISSIPATION

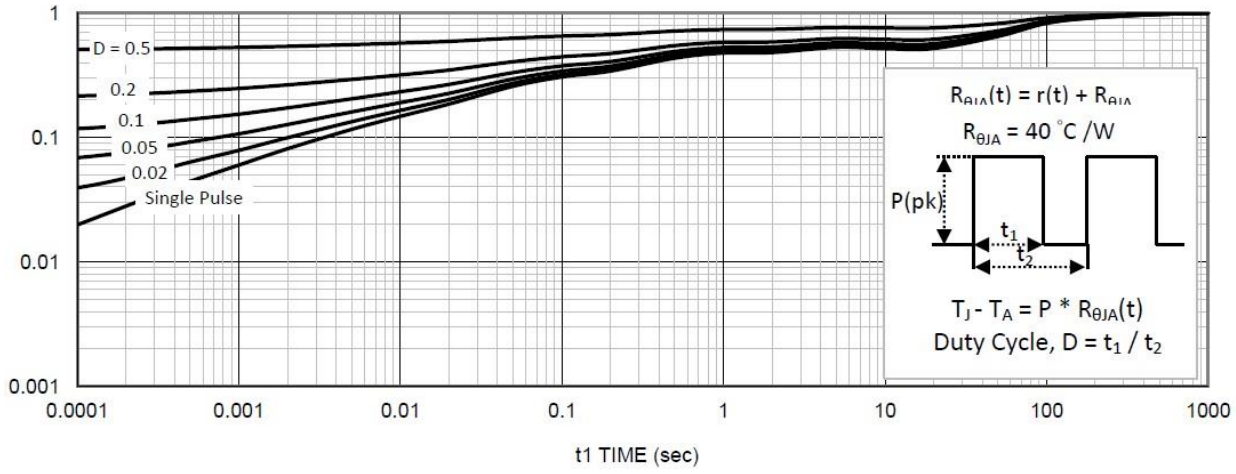

FIG.11-NORMALIZED THERMAL TRANSIENT JUNCTION TO AMBIENT

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