

RoHS Compliant Product
A suffix of "-C" specifies halogen free

DESCRIPTION

These miniature surface mount MOSFETs utilize a high cell density trench process to provide Low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation.

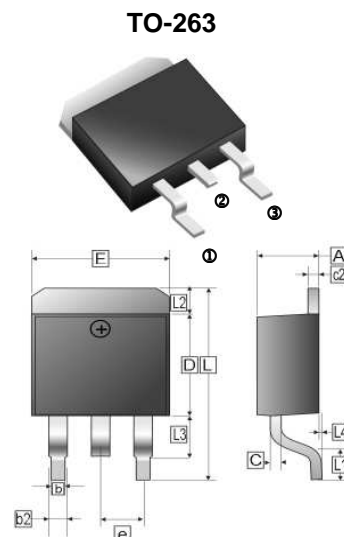
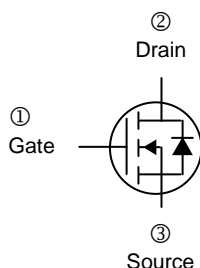
Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

FEATURES

- Low $R_{DS(on)}$ provides higher efficiency and extends battery life.
- Low thermal impedance copper leadframe DPAK saves board space.
- Fast switching speed.
- High performance trench technology.

PACKAGE INFORMATION

Package	MPQ	Leader Size
TO-263	0.8K	13 inch



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.00	4.85	c2	1.10	1.45
b	0.68	1.00	b2	1.34	REF
L4	0.00	0.30	D	8.0	9.15
C	0.36	0.53	e	2.54 REF	
L3	1.50	REF	L	14.6	15.85
L1	2.29	2.79	L2	1.27 REF	
E	9.60	10.45			

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	162	A
	$T_C=25^\circ\text{C}$		
Pulsed Drain Current ²	I_{DM}	360	A
Continuous Source Current (Diode Conduction) ¹	I_S	90	A
	$T_C=25^\circ\text{C}$		
Total Power Dissipation	P_D	234	W
	$T_C=25^\circ\text{C}$		
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~175	$^\circ\text{C}$
Thermal Resistance Rating			
Maximum Thermal Resistance Junction-Ambient ³	$R_{\theta JA}$	43	$^\circ\text{C} / \text{W}$
Maximum Thermal Resistance Junction-Case	$R_{\theta JC}$	0.64	$^\circ\text{C} / \text{W}$

Note:

1. Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 120A
2. Pulse width limited by maximum junction temperature
3. Surface Mounted on 1" x 1" FR4 Board.

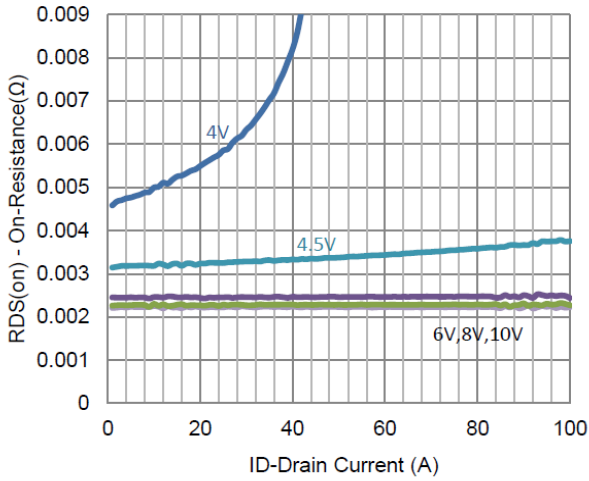
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	-	V	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$
Gate-Body Leakage	I_{GSS}	-	-	± 100	nA	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}$
		-	-	25		$V_{DS} = 32\text{V}, V_{GS} = 0\text{V}, T_J = 55^\circ\text{C}$
On-State Drain Current ¹	$I_{D(on)}$	120	-	-	A	$V_{DS} = 5\text{V}, V_{GS} = 10\text{V}$
Drain-Source On-Resistance ¹	$R_{DS(ON)}$	-	-	2.3	m Ω	$V_{GS} = 10\text{V}, I_D = 45\text{A}$
		-	-	3		$V_{GS} = 5.5\text{V}, I_D = 44\text{A}$
Forward Transconductance ¹	g_{fs}	-	35	-	S	$V_{DS} = 15\text{V}, I_D = 20\text{A}$
Diode Forward Voltage ¹	V_{SD}	-	0.82	-	V	$I_S = 45\text{A}, V_{GS} = 0\text{V}$
Dynamic ²						
Input Capacitance	C_{iss}	-	24600	-	pF	$V_{GS} = 0$ $V_{DS} = 15\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	C_{oss}	-	1560	-		
Reverse Transfer Capacitance	C_{rss}	-	1470	-		
Total Gate Charge	Q_g	-	138	-	nC	$V_{DS} = 20\text{V}$ $V_{GS} = 5.5\text{V}$ $I_D = 20\text{A}$
Gate-Source Charge	Q_{gs}	-	52	-		
Gate-Drain Charge	Q_{gd}	-	57	-		
Turn-on Delay Time	$T_{d(on)}$	-	54	-	nS	$V_{DS} = 20\text{V}$ $I_D = 20\text{A}$ $V_{GEN} = 10\text{V}$ $R_L = 1\Omega$ $R_{GEN} = 6\Omega$
Rise Time	T_r	-	85	-		
Turn-off Delay Time	$T_{d(off)}$	-	254	-		
Fall Time	T_f	-	86	-		

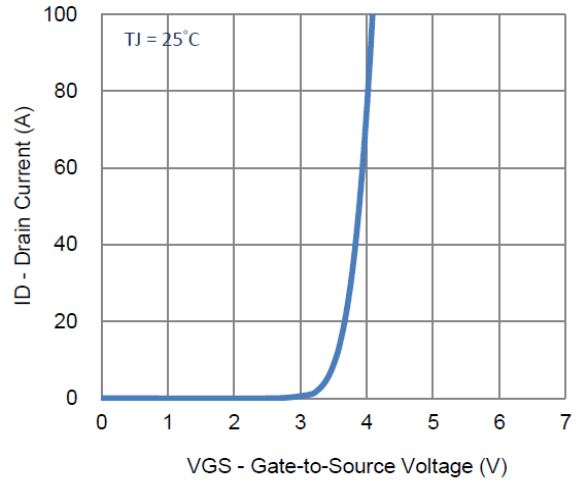
Notes:

1. Pulse test : Pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
2. Guaranteed by design, not subject to production testing.

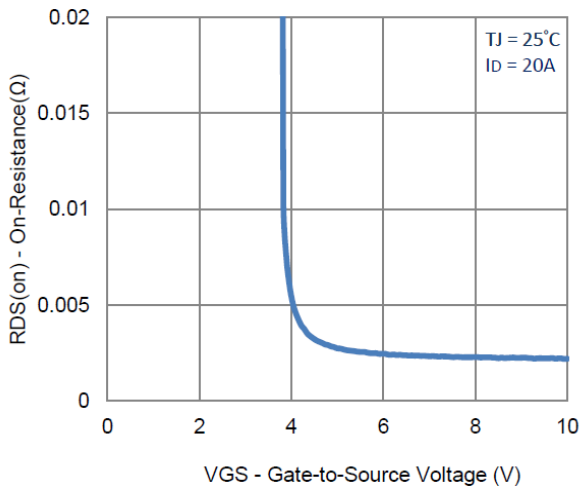
CHARACTERISTIC CURVE



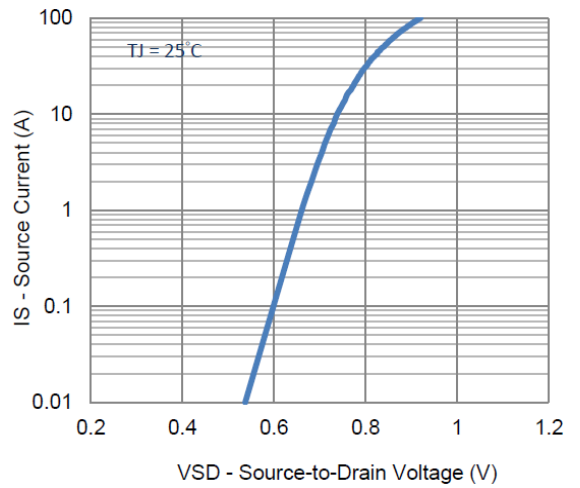
1. On-Resistance vs. Drain Current



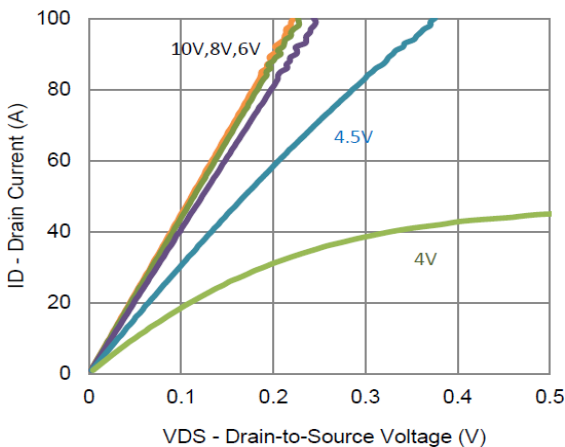
2. Transfer Characteristics



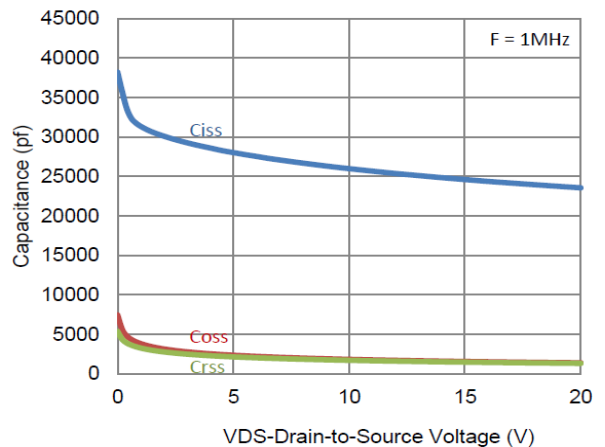
3. On-Resistance vs. Gate-to-Source Voltage



4. Drain-to-Source Forward Voltage

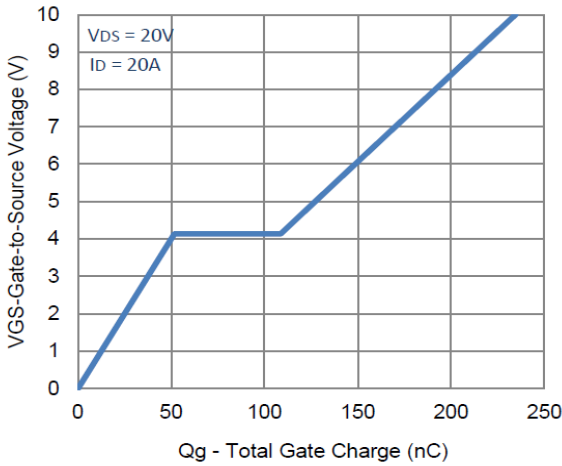


5. Output Characteristics

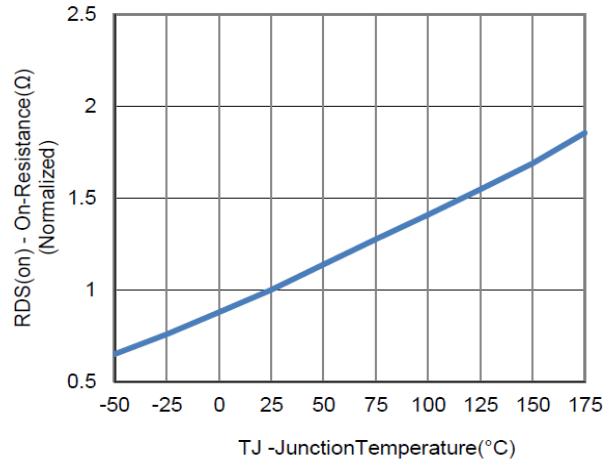


6. Capacitance

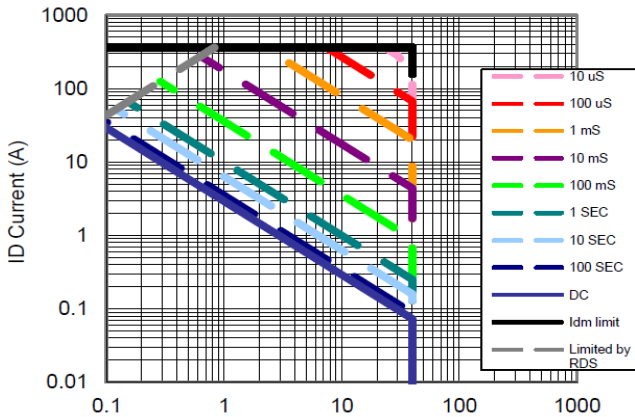
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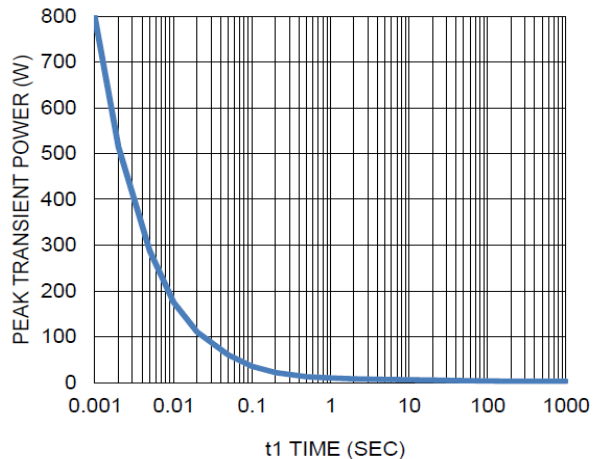
7. Gate Charge



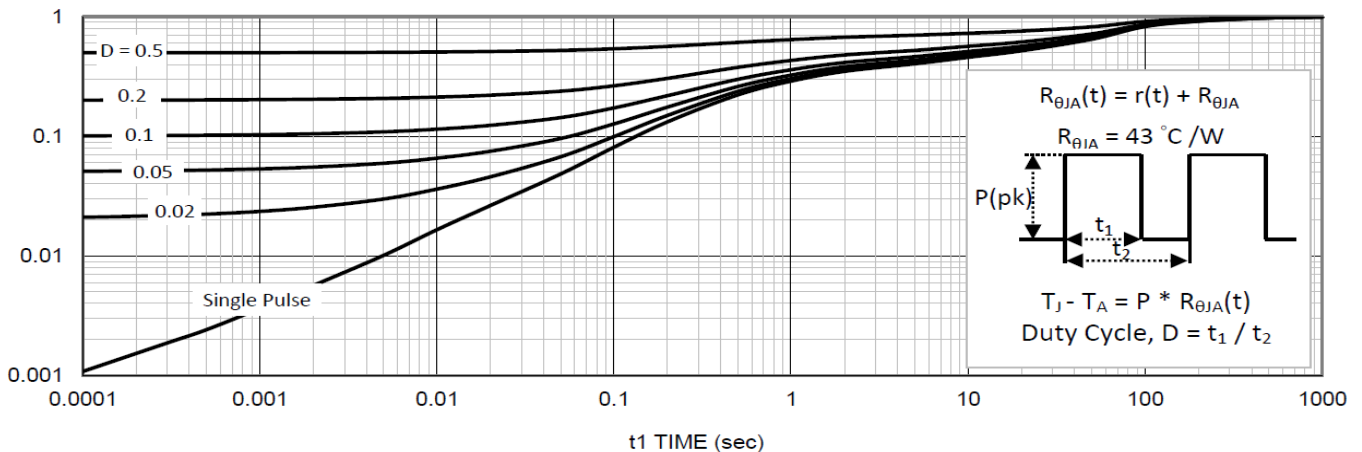
8. Normalized On-Resistance Vs Junction Temperature



9. Safe Operating Area



10. Single Pulse Maximum Power Dissipation



11. Normalized Thermal Transient Junction to Ambient