



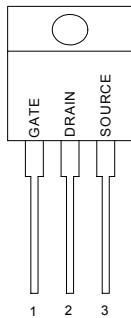
**APPLICATION**

- ◆ DC motor control
- ◆ UPS
- ◆ Class D Amplifier

$V_{DSS}$	$R_{DS(ON)}$ Typ.	$I_D$
60V	15.8mΩ	60A

**PIN CONFIGURATION**

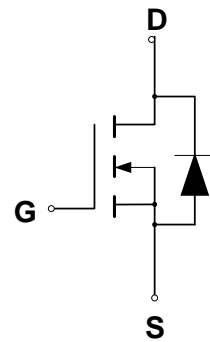
TO-220  
Front View



**FEATURES**

- ◆ Low ON Resistance
- ◆ Low Gate Charge
- ◆ Peak Current vs Pulse Width Curve
- ◆ Inductive Switching Curves

**SYMBOL**



N-Channel MOSFET

**ABSOLUTE MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Drain to Source Voltage (Note 1)	$V_{DSS}$	60	V
Drain to Current - Continuous $T_c = 25^\circ C$ , $V_{GS}@10V$	$I_D$	60	A
- Continuous $T_c = 100^\circ C$ , $V_{GS}@10V$	$I_D$	43	
- Pulsed $T_c = 25^\circ C$ , $V_{GS}@10V$ (Note 2)	$I_{DM}$	241	
Gate-to-Source Voltage - Continue	$V_{GS}$	±20	V
Total Power Dissipation	$P_D$	150	W
Derating Factor above 25		1.0	W/
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 175	
Single Pulse Avalanche Energy $L=144\mu H, I_D=40$ Amps	$E_{AS}$	500	mJ
Maximum Lead Temperature for Soldering Purposes	$T_L$	300	
Maximum Package Body for 10 seconds	$T_{PKG}$	260	
Pulsed Avalanche Rating	$I_{AS}$	60	A

**THERMAL RESISTANCE**

Symbol	Parameter	Min	Typ	Max	Units	Test Conditions
$R_{\theta JC}$	Junction-to-case			1.0	/W	Water cooled heatsink, $P_D$ adjusted for a peak junction temperature of +175
$R_{\theta JA}$	Junction-to-ambient			62	/W	1 cubic foot chamber, free air

**ORDERING INFORMATION**

Part Number	Package
CMT60N06	TO-220

**ELECTRICAL CHARACTERISTICS**Unless otherwise specified,  $T_J = 25$  .

Characteristic	Symbol	CMT60N06			Units
		Min	Typ	Max	
<b>OFF Characteristics</b>					
Drain-to-Source Breakdown Voltage ( $V_{GS} = 0\text{ V}$ , $I_D = 250\ \mu\text{A}$ )	$V_{DSS}$	60			V
Breakdown Voltage Temperature Coefficient (Reference to $25$ , $I_D = 250\ \mu\text{A}$ )	$V_{DSS}/\Delta T_J$		0.069		mV/
Drain-to-Source Leakage Current ( $V_{DS} = 60\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 25$ ) ( $V_{DS} = 48\text{ V}$ , $V_{GS} = 0\text{ V}$ , $T_J = 150$ )	$I_{DSS}$			25 250	$\mu\text{A}$
Gate-to-Source Forward Leakage ( $V_{GS} = 20\text{ V}$ )	$I_{GSS}$			100	nA
Gate-to-Source Reverse Leakage ( $V_{GS} = -20\text{ V}$ )	$I_{GSS}$			-100	nA
<b>ON Characteristics</b>					
Gate Threshold Voltage ( $V_{DS} = V_{GS}$ , $I_D = 250\ \mu\text{A}$ )	$V_{GS(th)}$	1.0	2.0	3.0	V
Static Drain-to-Source On-Resistance (Note 4) ( $V_{GS} = 10\text{ V}$ , $I_D = 60\text{A}$ )	$R_{DS(on)}$		15.8	18	m $\Omega$
Forward Transconductance ( $V_{DS} = 15\text{ V}$ , $I_D = 60\text{A}$ ) (Note 4)	$g_{FS}$		36		S
<b>Dynamic Characteristics</b>					
Input Capacitance	( $V_{DS} = 25\text{ V}$ , $V_{GS} = 0\text{ V}$ , $f = 1.0\text{ MHz}$ )	$C_{iss}$		1430	pF
Output Capacitance		$C_{oss}$		420	pF
Reverse Transfer Capacitance		$C_{rss}$		88	pF
Total Gate Charge ( $V_{GS} = 10\text{ V}$ )	( $V_{DS} = 30\text{ V}$ , $I_D = 60\text{ A}$ , $V_{GS} = 10\text{ V}$ ) (Note 5)	$Q_g$		37.7	nC
Gate-to-Source Charge		$Q_{gs}$		8.4	nC
Gate-to-Drain ("Miller") Charge		$Q_{gd}$		9.8	nC
<b>Resistive Switching Characteristics</b>					
Turn-On Delay Time	( $V_{DD} = 30\text{ V}$ , $I_D = 60\text{ A}$ , $V_{GS} = 10\text{ V}$ , $R_G = 9.1\Omega$ ) (Note 5)	$t_{d(on)}$		12.1	ns
Rise Time		$t_{rise}$		64	ns
Turn-Off Delay Time		$t_{d(off)}$		69	ns
Fall Time		$t_{fall}$		39	ns
<b>Source-Drain Diode Characteristics</b>					
Continuous Source Current (Body Diode)	Integral pn-diode in MOSFET	$I_S$		60	A
Pulse Source Current (Body Diode)		$I_{SM}$		241	A
Diode Forward On-Voltage ( $I_S = 60\text{ A}$ , $V_{GS} = 0\text{ V}$ )		$V_{SD}$		1.5	V
Reverse Recovery Time	( $I_F = 60\text{ A}$ , $V_{GS} = 0\text{ V}$ , $d_i/d_t = 100\text{A}/\mu\text{s}$ )	$t_{rr}$		55	ns
Reverse Recovery Charge		$Q_{rr}$		110	nC



# CMT60N06

## N-CHANNEL Logic Level Power MOSFET

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Note 1:  $T_J = +25$  to  $+175$

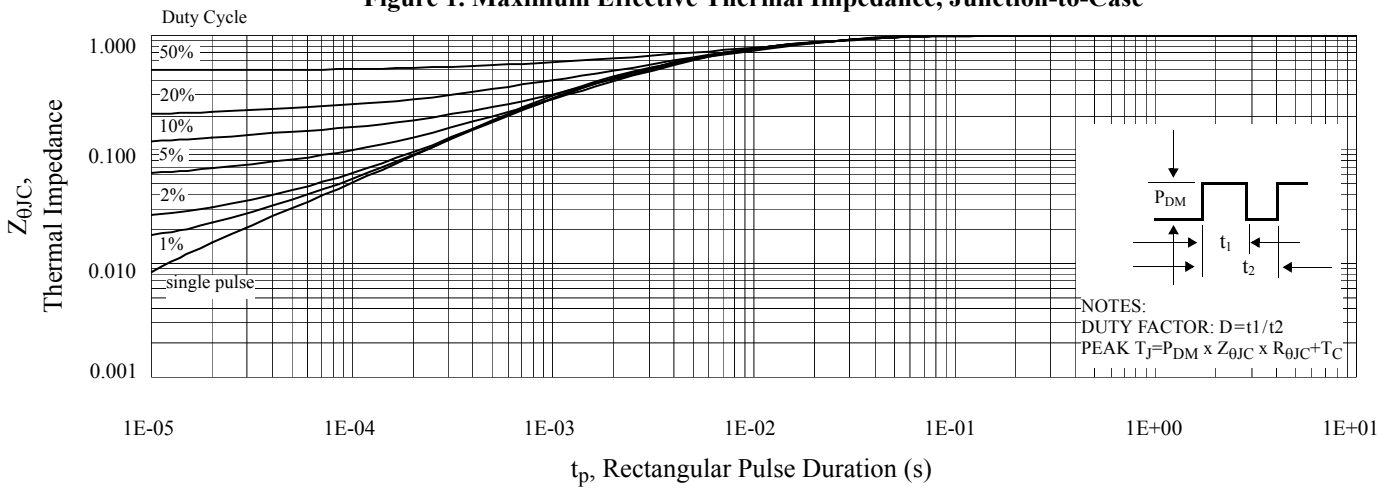
Note 2: Repetitive rating; pulse width limited by maximum junction temperature.

Note 3:  $I_{SD} = 60A$ ,  $di/dt \leq 100A/\mu s$ ,  $V_{DD} \leq BV_{DSS}$ ,  $T_J = +175$

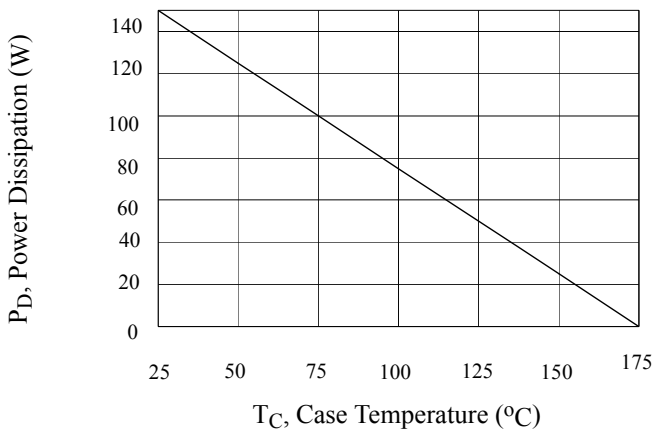
Note 4: Pulse width  $\leq 250\mu s$ ; duty cycle  $\leq 2\%$

Note 5: Essentially independent of operating temperature.

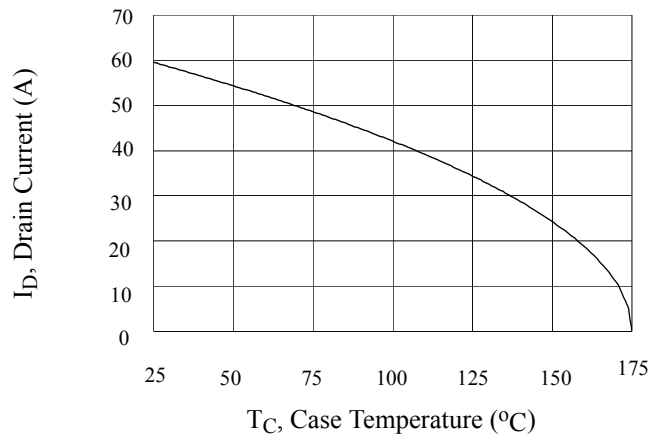
**Figure 1. Maximum Effective Thermal Impedance, Junction-to-Case**



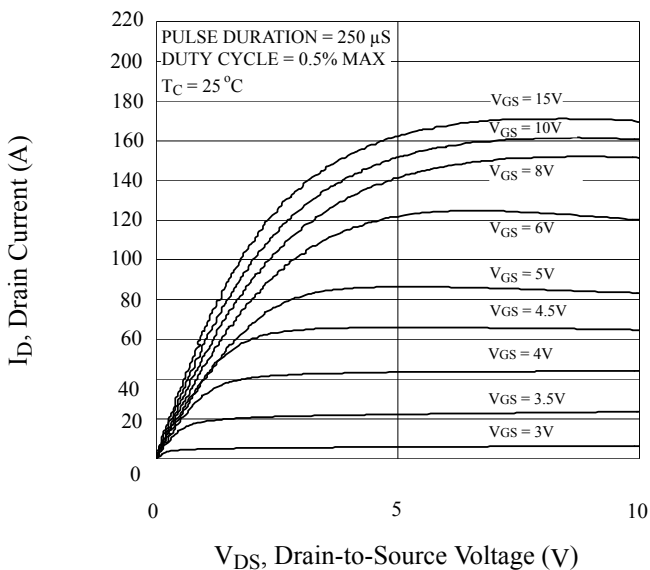
**Figure 2. Maximum Power Dissipation vs Case Temperature**



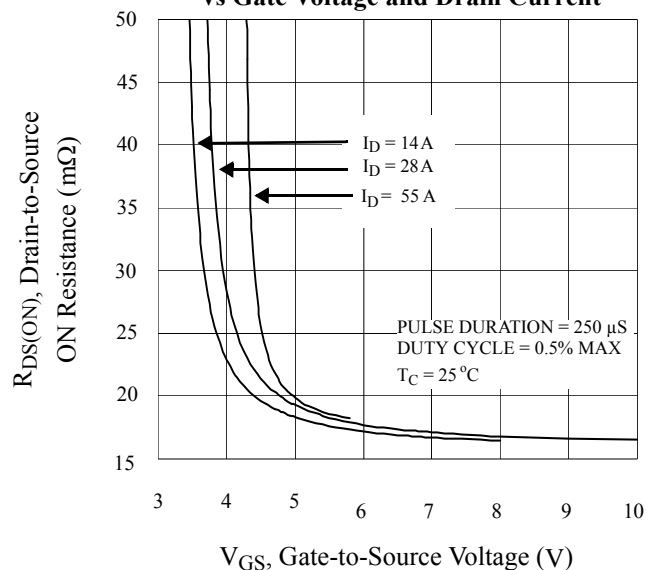
**Figure 3. Maximum Continuous Drain Current vs Case Temperature**



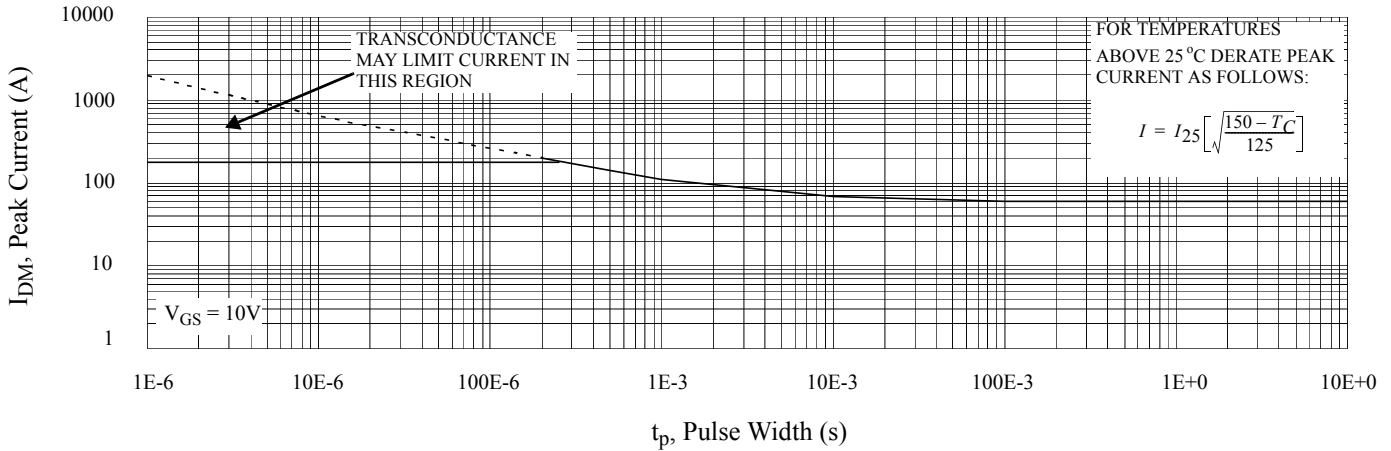
**Figure 4. Typical Output Characteristics**



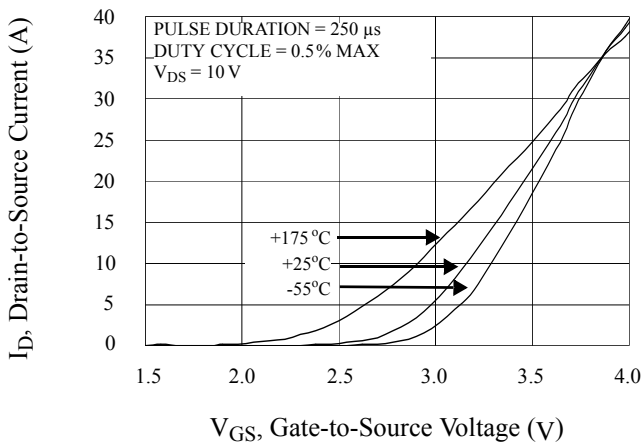
**Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current**



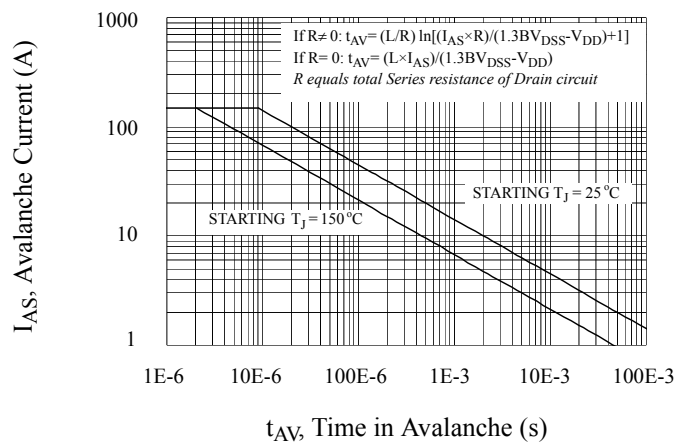
**Figure 6. Maximum Peak Current Capability**



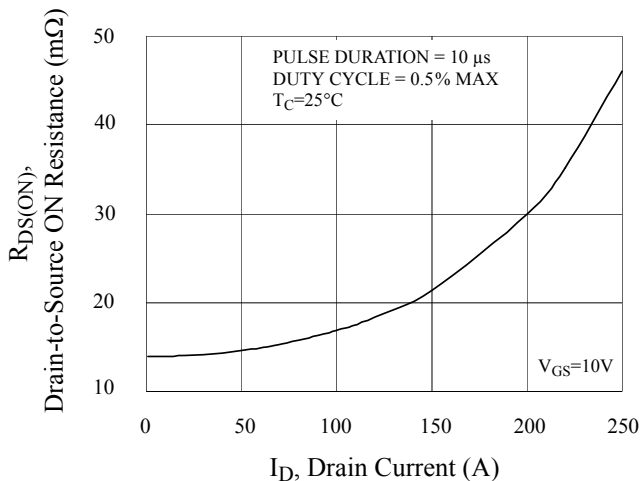
**Figure 7. Typical Transfer Characteristics**



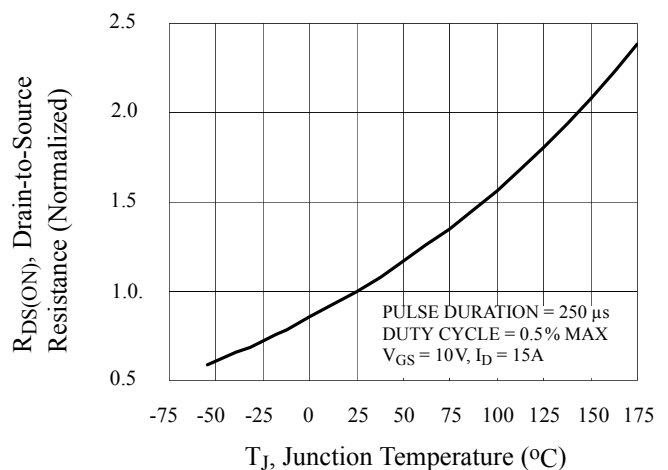
**Figure 8. Unclamped Inductive Switching Capability**



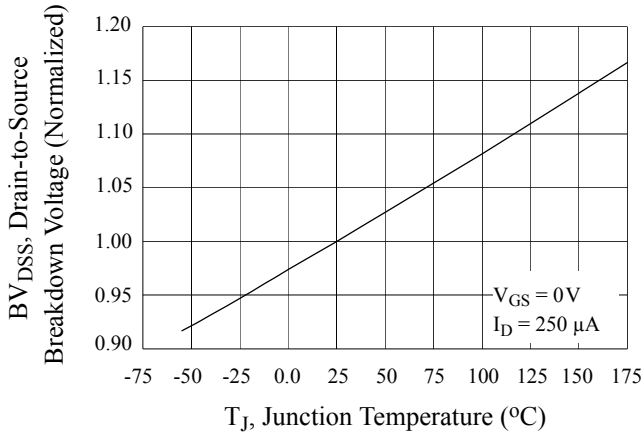
**Figure 9. Typical Drain-to-Source ON Resistance vs Drain Current**



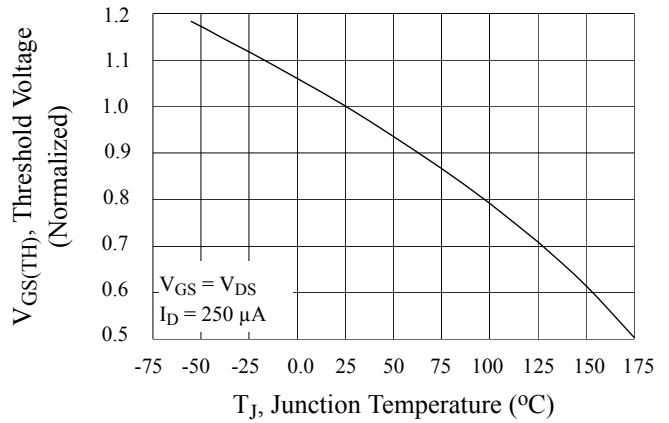
**Figure 10. Typical Drain-to-Source ON Resistance vs Junction Temperature**



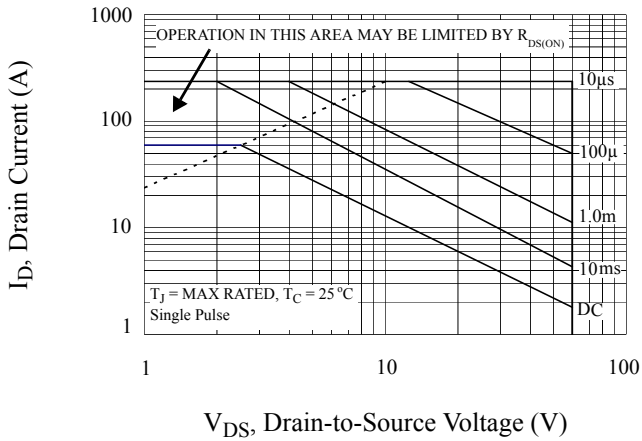
**Figure 11. Typical Breakdown Voltage vs Junction Temperature**



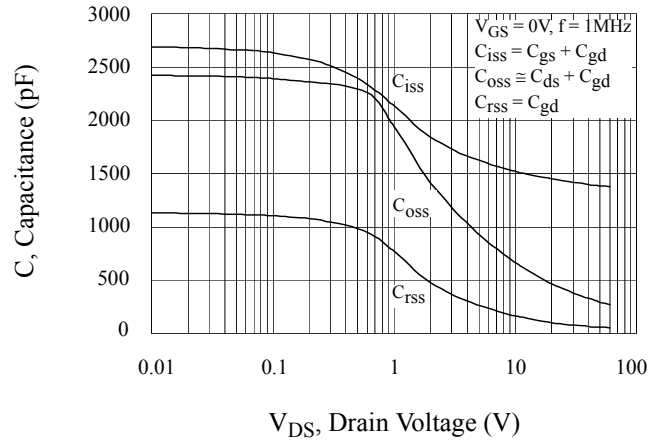
**Figure 12. Typical Threshold Voltage vs Junction Temperature**



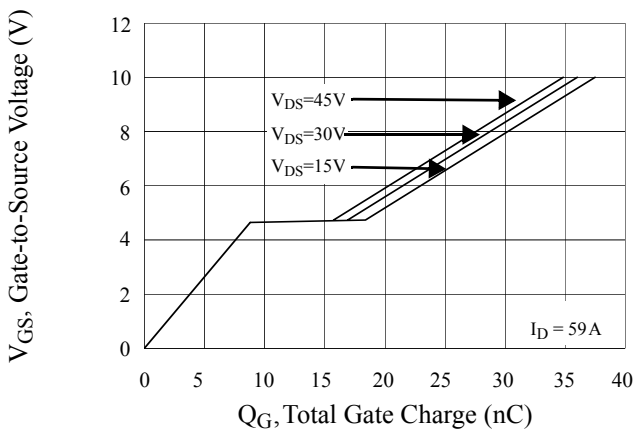
**Figure 13. Maximum Forward Bias Safe Operating Area**



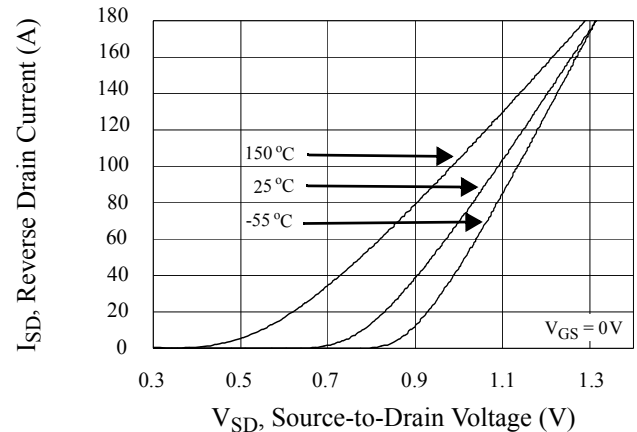
**Figure 14. Typical Capacitance vs Drain-to-Source Voltage**

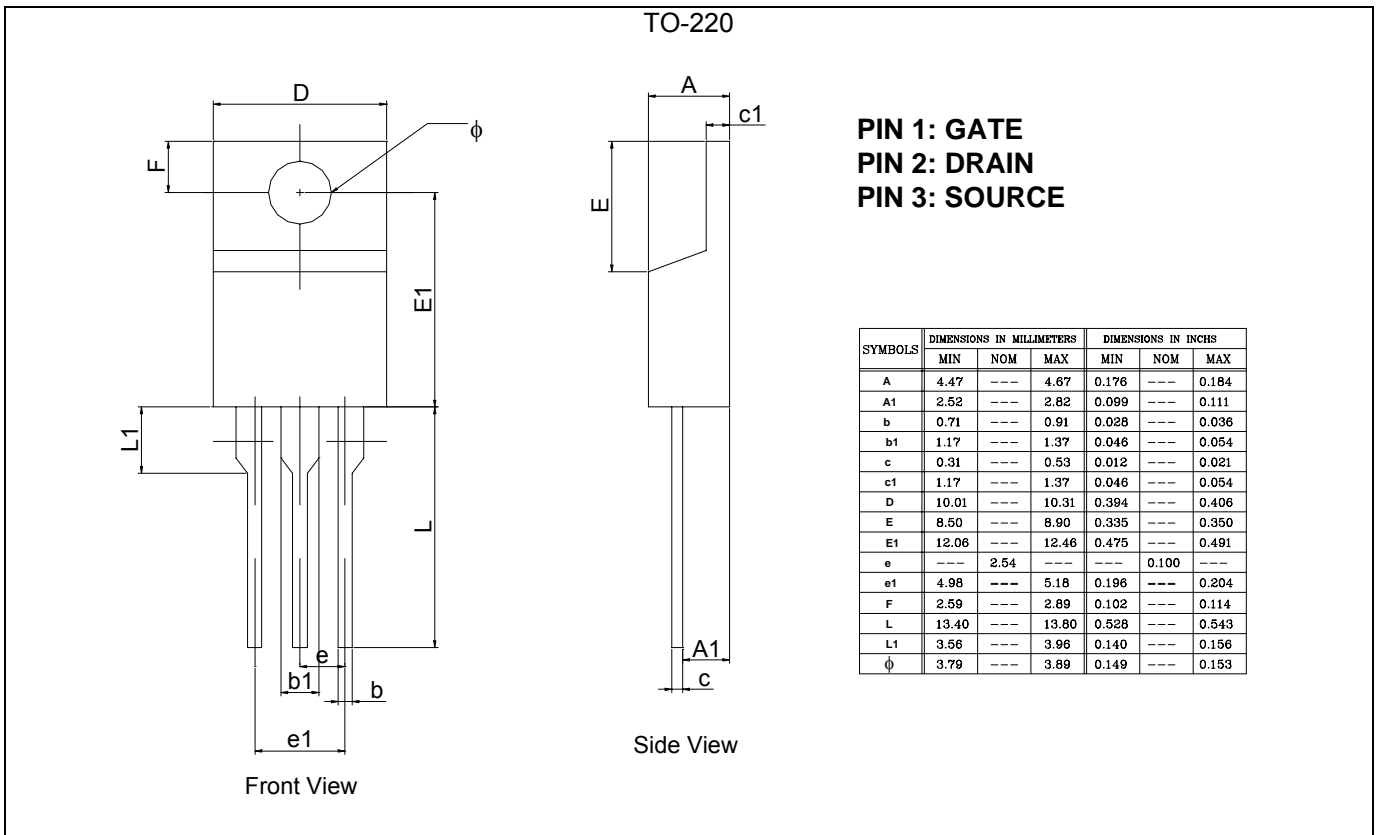


**Figure 15. Typical Gate Charge vs Gate-to-Source Voltage**



**Figure 16. Typical Body Diode Transfer Characteristics**



**PACKAGE DIMENSION**


### IMPORTANT NOTICE

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